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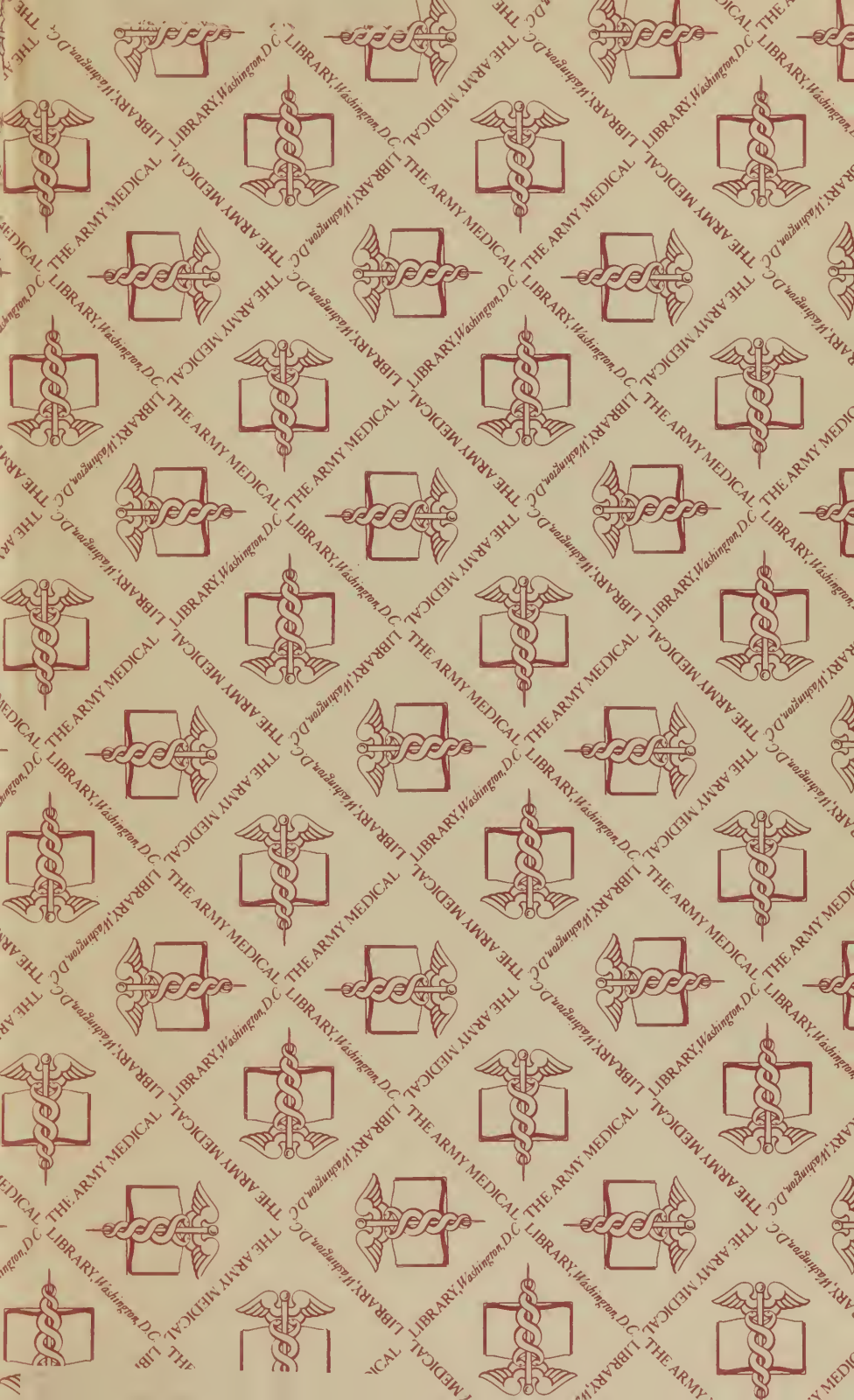
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REPORT AND REMARKS

ON A

FOURTH AND A FIFTH HUNDRED

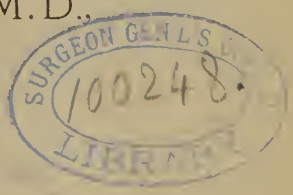
OF

CATARACT EXTRACTIONS,

ACCORDING TO VON GRAEFE'S METHOD.

BY H. KNAPP, M.D.,

OF NEW YORK.



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REPORT AND REMARKS ON A FOURTH AND A FIFTH HUNDRED CATARACT EXTRACTIONS, ACCORDING TO VON GRAEFE'S METHOD.

By H. KNAPP, of New York.

When I published, seven years ago, the report of a third hundred cataract extractions by the peripheric linear section, that method enjoyed an almost uncontested favor on the part of eye surgeons. But as soon as its great originator closed his eyes, a recurrent—not to say reactionary—wave arose in different places. The adherents of the classical flap extraction, held their field, and gained ground. Others made greater or smaller allowances to the flap method, using Graefe's narrow knife, making puncture and counterpuncture in the corneo-scleral juncture, but lower than Von Graefe did, thus forming a flap of small elevation. This variety I saw very extensively practised when I traveled in Europe in 1871. *A. Pagenstecher* continued to extract the lens together with the capsule. *Alfred Graefe* followed the method of his illustrious cousin, but with a lower section. *Adolph Weber* was very sanguine of his method. *Liebreich* performed a more or less linear section, in the lower segment of the cornea, sometimes with, mostly without iridectomy, the centre of the section lying about midway between the centre of the cornea and its lower margin. *Le Brun* did

the same in the upper segment. Two years ago, *L. de Wecker* published his "new method of cataract extraction—extraction with a peripheric flap—" (Paris, Gauthier-Villars, 1875, see these Arch. IV. p. 465), and his assistant, Masselon, communicated the results of 179 operations done according to this method. (See these Archives, vol. V. p. 239). *Wecker's* peripheric flap is situated in the limbus conjunctivæ, and comprises one-third of the circumference of the limbus. No iridectomy is performed. Prolapsed iris is pushed back with a blunt spatula, and kept in position by the instillation of the alcaloid of calabar bean, called eserine.

Besides these, there are many unimportant deviations from Graefe's method which I need not mention.

Does the method of a great practical genius deserve to be so soon abandoned, or is this recurrent movement only the natural reaction after too enthusiastic expectations? The discussion of this question can be taken up by theoretical reasoning, or by statistical deductions, or by both combinedly. The latter is the best way. In this sense I shall endeavor to analyze the last two hundred cases of extraction, which I have made according to V. Graefe's method. I shall begin with the statistical part, and thus deduct from facts the influence, favorable or prejudicial, which each factor of our problem exercises on the immediate and final results. In order to make the deductions as objective as possible, and divest them from my personal views, I shall present condensed histories of the cases in a tabulated form, extracted from the extensive records kept by the resident assistant surgeons of the N. Y. Ophthalmic and Aural Institute. The cases are not, in any way, selected; but represent all that I have operated on according to Graefe's method, from April, 1869, to June, 1876, with the exception of a few cases in which detachment of the retina was present and diagnosticated before the operation. Detachment of the retina is commonly considered a contra-indication to any operation for cataract. Yet, if there is only one eye left, and this suffers from cataract and absence of the upper half of the field of vision, the operation, it seems to me, is justifiable, and in some cases on which I have operated,

the patients were so much benefited that for some years they were enabled to see their way in walking. The 200 cases of extraction here compiled are not the only ones which I performed in the space of seven years. Several times I abandoned Graefe's method and tried another. This was, however, not done in such a way that the promising cases were given to the new method, and the unpromising to Graefe's, but when I determined to test the value of a new method, I tried it on all cases that came under my care. Though the results I obtained by *Graefe's* method in America fall short of what I obtained by it in Heidelberg, I still adhere to it as the method which yielded me better results than any other I have tried.

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
1	J. M. Heb. N. Y. City.	70	Decrepit and nervous man.	Hard. Ripe.		April, 1869.	Peripheric section.	No anæsthesia. Escape of *vitreous* by spasmodic closure of lids during pressure on cornea. Lens extracted with large *spoon* easily and totally.
2	G. M. Ger. Egg H'rbor N. Y.	66		Hard. Ripe.		June, 1869.		
3	D. B. Ger. Poughkeepsie, N. Y.	60		Hard. Ripe.		May, 1869.		Cortex and blood remained in anterior chamber.
4	Mrs. H. Cr. Am. Hebron, N. Y.	54		Hypermature		June, 1869.	Cut rather small.	Expulsion difficult.
5	F. H. Ger. Union Sp'ngs Ala.	50		Hypermature		Sept. 1869.	Anterior capsule removed with cystotome.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
Very painful *hyalitis*, cyclitis and iritis, with closure of pupil. From the fifth to the tenth day + T1. After six weeks eye quiet. T1. Treatment internal: sedative; local: atropine and leeches.	35	1/∞		1/∞	The loss of the eye was caused by the introduction of a large spoon. *Anæsthesia* might have obviated the loss of vitreous, and saved the eye. Patient died 18 months after operation of general debility.
	24	20/50		20/20	
Hurt eye eleven days after operation. Wound *reopened*, but closed again in two days. Discharged with considerable *cortex* in anterior chamber. Free from irritation.	19	10/200		20/40	
	10	20/100		20/50	
Wound spontaneously (?) reopened on 3d day, but closed the following night.	14	20/40			

No. of Case.	Name, Nativity, Residence.	Age.	General Condition.	Quality of Cataract.	Condition of Eye.	Time of Operation.	Execution of Operation.	Incidents of Operation.
6	Mrs. M. Am. B'klyn	60		Hard.				Section *small*. Considerable *rubbing* to expel the remnants of tenacious corticalis.
7	A. M. Heb. N. Y. City.	58	Nervous, timid man.	Hard.	Externally nothing unusual. Highly myopic.	Oct. 1869.		Blood after section, quickly coagulating, made other steps of operation difficult. No accident. Chloroform.
8	Mrs. T. St. Heb. N. Y. City.	63		Hard.				
9	Mrs. M. C. Irish. N. Y. City.	62		Hard. Ripe.		Nov. 1869.	Usual Graefe's section; apex touching corneal margin.	
10	Dr. W. Am. N. Ca.	67		Hard.	Eye deep-seated.	Nov. 1869.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
Ring-abscess. Panophthalmitis. Phthisis bulbi.	17	0		0	The loss is attributed to the bruising of the small wound during extrusion of lens and cortex.
	16	$\frac{6}{200}$		$\frac{20}{100}$	Extensive sclero-choroiditis and rarefaction of choroid. Other eye had unsuccessfully been operated on two years previously.
	12	$\frac{20}{100}$		$\frac{20}{50}$	Died two years later.
Suppuration began at inner corner of wound in cornea and iris. Unsuccessfully treated by warm applications and paracentesis of ant. chamber by reopening the wound. Flat leucoma.	14	0		0	
	18	$\frac{15}{200}$	The center of a thin secondary cataract torn with a sickle needle 20 days after	$\frac{15}{200}$	The optical conditions being excellent, atrophy of opt. disc was discovered ophthalmoscopically as

No. of Case.	Name, Nativity, Residence.	Age.	General Condition.	Quality of Cataract.	Condition of Eye.	Time of Operation.	Execution of Operation.	Incidents of Operation.
10								
11 12	Mrs. B. S. Ger. Newark, N. J.	58		Hard. Ripe, in both eyes.		Dec. 1869.	Both eyes at the same time.	
13	A. F. S. Ger. N. Y. City	61		Hard. Ripe.				
14	Mrs. Z. Ger. Ct.	42		Immature. Swollen.		Feb. 1870.		Capsule opened with knife during its passage through anterior chamber.
15	Mrs. I. Am. Newark, N. J.	76		Complicated.	High degree of M. Synechiæ. Post. capsule thickened.	March 1870.	Sec. down & outward. Iridectomy removing all synechiæ. Thickened caps. circumcis'd with cystotome, and ext. with forceps.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS		extract. Reaction slight. Pupil clear. Discharged 5 days after secondary operation.		the cause of low V.—— Other eye unsucessfully operated on (by extraction) previously. Died a year after operation.
	16	$\frac{20}{100}$		$\frac{20}{30}$	
		$\frac{20}{100}$		$\frac{20}{30}$	
On third day hemorrhage in ant. chamber from patient hurting his eye during bandaging. Disappeared in a few days.	12	$\frac{20}{30}$		$\frac{20}{20}$	
Cystoid protrusion in one corner of wound. No irritation from it up to this time, May, 1877.	11	$\frac{20}{200}$	Division of sec. cataract with sickle needle 6 mos. after extraction. No reaction.	$\frac{20}{40}$	The other eye being unaffected, the extraction should have been delayed until the swelling by imbibition of the cataract had disappeared.
	9	$\frac{20}{200}$		$\frac{20}{30}$	

No. of Case.	*Name. Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
16 17	L. S. Ger. Brooklyn, N. Y.	57		Right eye hard, left eye hypermature with thickened capsule.		May, 1870.		Left: Dislocation of lens while tearing the capsule. Thickened capsule extracted. On pressure with spoon, vitreous pres'nted. Lens extracted with large spoon. One or two drops of vitreous escaped.
18	F. Pf. Ger. N. Y. City.	61		Hard. Ripe.		May, 1870.		
19	M. R. Ger. N. Y. City.	64		Hard. Ripe.		June, 1870.		Dislocation of lens with cystotome. Lens extracted with sharp hook. A few drops of vitreous escaped.
20	C. B. Ger. N. Y. City.	37		Soft. Ripe.	7 months previously a small piece of iron pierced the cornea & remained in the ant. cortex,	May, 1870.	Piece of iron came out with lens.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
	16	$\frac{20}{100}$			
Left tardy union of wound.		$\frac{20}{100}$			
	13	$\frac{20}{100}$			
	8	$\frac{20}{100}$			
The third day *spongy exudation* appeared in ant. chamber, fourth day densest, filling the whole chamber. Pulse 72. Chemosis, 5th day: it began to absorb from the periphery, showing sharp edges.	12	$\frac{20}{100}$		$\frac{20}{30}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
20					where it was seen during the extraction and removed with the lens.			
21	S. L. Span. Porto Rico.	46		Hard. Ripe.		July, 1870.	Usual peripheric linear section.	A small quantity of cortical substance left.
22	S. K. Ger. N. Y.	58		Hard. Ripe.	Coloboma from previous iridectomy.	Aug. 1870.	Large section for large lens.	
23	G. S. Ger. Newark, N. J.	59		Hard. Ripe.		Sept. 1870.		
24	B. K. Ger. Blissville, L. I.	50		Hard. Ripe.		Sept. 1870.	Center of anterior capsule removed.	
25	J.A.D. Fren. N. Y. City.	36		Half-soft. Large.				Capsule divided with knife in passing through ant. chamber.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
6th day, no chemosis. Exudation limited to pupillary space. Iris clear. 10th day: pupil free and clear, iris bright.	12	$\frac{20}{100}$		$\frac{20}{30}$	
The 2d day purulent infiltration of the wound under the conjunctival flap. Pain. Chemosis. Pulse, 60. 3d day ant. chamber filled with dark blood. Slow iritis. Closure of pupil.	26	$\frac{1}{\infty}$ in all p'rts of F.			The weather was very hot. He said that in Porto Rico, his home, he had not suffered so much from the heat as in New York.
No reaction whatever.	7	$\frac{20}{100}$		$\frac{20}{30}$	
Capsulitis plastica. Blood in pupil. Pupil large.	12	$\frac{10}{200}$			Patient left the hospital without permission. Prospect of improvement of S. favorable.
	11	$\frac{20}{40}$		$\frac{20}{20}$	
	12	$\frac{20}{50}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Exsecution of Operation.*	*Incidents of Operation.*
26	M. S. Ger. N. Y. City.	67		Hard. Ripe.	Corneal specks.	Oct. 1870.		
27	H. W. Ger. N. Y. City.	43		Half-soft.		Oct. 1870.		
28	Mrs. E. W. Ger. N. Y. City.	63		Hard.		Oct. 1870.		Escape of some vitreous, when spoon pressed upon cornea. Lens expelled by cautious pressure, no instrument entering the eye.
29	Miss J. L. Am. N. Y. City.	36		Hypermature flat, disciform. Centre of capsule thickened.		Oct. 1870.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operation.*	*Ultimate V.*	*REMARKS.*
	DAYS 11	$\frac{20}{200}$			
Pupil clouded.	14	$\frac{15}{200}$	Division of pupillary membrane 9 days after extraction. No reaction. Discharged 5 days later.	$\frac{20}{40}$	
	17			$\frac{20}{50}$	
Pupillary opacities.	8	$\frac{13}{200}$	Division 5 weeks after extraction. No reaction.	$\frac{20}{30}$	Extraction in the other eye 7 years previously had been followed by pupillary opacities They were divided at the same time with the eye before mentioned. Severe reaction followed for six weeks. No improvement.

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
30	M. L. Am. N. Y. City.	31		Soft. Ripe.		Oct. 1870.	Centre of capsule removed.	
31	Rev. D. Am. Belleville, N. Y.	72		Hard. Ripe.				
32	Mrs. C. B. Am. Morrisania, N. Y.	45		Half-soft.		Oct. 1870.	A good deal of *rubbing* on cornea in removing the corticalis.	
33	A. McS Irish. N. Y. City.	61		Hard. Ripe.		Oct. 1870.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 6	$\frac{20}{70}$		$\frac{20}{20}$	
On fourth day, blood in anterior chamber, absorbed in six days.	11	$\frac{20}{50}$	Six months after extract. S. $\frac{20}{100}$. Division of wrinkled caps. with Graefe's knife. No reaction. Discharged in 5 days.	$\frac{20}{40}$	
On 3d day pain. Lids and conjunctiva swollen. Centre of wound bulging and white. Ant. chamber turbid. Iris swollen. Pupil narrow. The bulging portion of wound *incised*, perpendicularly to section, pus removed. Leeches to temple. Atropine. The inflammation (*keratitis suppurativa partialis et iritis*) at once abated, and ended in 10 days.	12	$\frac{20}{200}$		$\frac{20}{70}$	
The *second day* œdema of lids. Pulse 84. Chemosis. Iris discolored. Inner angle of wound white, raised. It was incised and pus liberated. Symptoms abated. *3d day:* Purulent secretion. Inner angle healthy looking. Outer angle of wound white. swollen; puriform exuda-	21	$\frac{6}{200}$	63 days after extraction iridectomy, connecting with pupil. Incision with Beers' knife through pupillary membrane. Iris drawn out with Tyrell's hook.	$\frac{20}{40}$	The splendid recovery in this case is attributed to the energetic after-treatment.

No. of Case.	*Name. Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
33		61				Oct. 1870.		
34	A. L. Ger. N. Y. City.	50		Very old traumatic and partially dislocated cataract which had freed him from military service. Anterior capsule thickened. (Complicat'd)		Nov. 1870.		Immediately after the section fluid vitreous escaped. The prolapsed iris was cut off. Lens was brought out with capsule by spoon passed behind post. capsule. During extraction a hard rubber spoon was gently pressed on the cornea, following the course of the lens from below upward. Loss of vitreous inconsiderable. Wound closed nicely.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
tion extending from it into ant. chamber. Ant. chamber cloudy; iris swollen, yellowish white. Pupil plugged with a grayish-white substance. Outer angle deeply incised, pus liberated; six leeches to temple. *4th day:* Less pain at night. Purulent discharge diminished. Edges of wound in their whole length white, infiltrated. Ant. chamber filled with whitish flakes. Pulse 75. Wound vertically incised at several points, anterior chamber tapped, and almost all the pus in it evacuated. *5th day:* No pain during night. Discharge less; anterior chamber restored, clear. Pupil partially free. The inflammatory symptoms steadily abated. Pupillary membrane. Tn. F complete.	DAYS				
2d day: ant. chamb. filled, middle third of wound gaping, but bridged over by raised conjunctiva. The conjunctiva was incised several times, but it always closed again over night, and the union of the wound progressed but slowly from the sides. From the 13th to the 28th day the gaping wound was touched five times with nitrate of silver in substance, which reduced its size to about one-fourth. Pat. wanted to leave the Hospital. At his house I touched the wound twice at an interval of seven days. The first touching was followed by hardly any reaction, the second by suppurative inflammation, which destroyed the eye.	28	$\frac{20}{200}$		0	It is likely that without the touching the wound would slowly have closed, and the eye might have recovered.

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
35	Mrs. S. G. Am. N. Y. City.	65		Hypermature; thickened capsule.		Nov. 1870.	Anterior capsule removed.	The section, too small for the lens, was extended, after which the cataract readily slipped out. (Smooth.)
36	Mrs. A. F. Ger. N. Y. City.	57		Hard. Ripe.				
37	Mrs. C. Am. Hebron, N. Y.	50		Ripe. Hard.		Nov. 1870.	A very smooth operation. Pat. told time at the watch to the minute.	
38	J.U.F. Ger. N. Y. City.	45		Half-soft. Ripe.		Nov. 1871.		
39 40	J. G. Neg. N. Y. City.	71	Fat & feeble.	Both hypermature		Dec. 1871.		
41	J. G. Irish. N. Y. City.	61		Ripe. Hard.		Dec. 1871.		
42	J.W. K Ger. Vancouvers I.	61		Partially dislocated; capsule thicken-		Jan. 1872.		The thickened portion of capsule was circumcised; but could not be removed

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
After-bleeding in ant. chamb. four days after extraction. In the course of 18 months V diminished to $\frac{15}{200}$ by vertically folded and striped secondary cataract (posterior capsule).	DAYS 10	$\frac{20}{70}$	18 months after operation division of sec. cataract by Graefe's knife. Reaction slight.	$\frac{20}{70}$	Three years after the second operation plastic cyclitis and opacities of the vitreous set in, reducing V to $\frac{1}{200}$. No irritation of other eye.
	13	$\frac{20}{50}$ $\frac{20}{20}$	(4 months.) (5 years.)		
Suppuration, beginning at the edges of the wound, presenting the form of ring abscess the third day. Panophthalmitis.	18	0		0	The other eye successfully operated on 15 months previously. Case 4 of this table.
	9	$\frac{10}{50}$		$\frac{20}{30}$	
Slow healing. Wounds gaping and ectatic. Cystoid cicatrices, synechiæ and pupillary obstructions in both.	25	$\frac{6}{200}$ $\frac{15}{200}$			
Swelling of lids and conjunctiva. Copious mucoserous discharge. Spongy exudation. Iritis. Slight synechiæ.	18	$\frac{20}{100}$		$\frac{20}{50}$	
On the 7th day, struck his eye, the recovery of which had proceeded favorably.	14	$\frac{20}{100}$		$\frac{20}{70}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
42		61		ed (complicated.)		Jan. 1872.		with forceps. After the expulsion of the lens, it was extracted with forceps. Some cortex remaining.
43	M. R. Ger. N. Y. City.	48		Half-soft, mature		Jan. 1872.	Knife split the capsules, but a more extensive laceration was made afterwards.	
44	F. O. Ger. N. Y. City.	69		Hard. Ripe.		Feb. 1872.	A quadrangular piece of anterior capsule removed.	
45	Mrs. M. K. Ger. N. Y. City.	59		Hard. Ripe.		Feb. 1872.	Quadrangular piece of capsule cut out.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
The wound burst and some vitreous escaped. No bad consequences.	DAYS				
	12	$\frac{20}{70}$			
Capsulitis Suppurativa et hæmorrhagica.—The upper edge of the remaining capsule first showed white patches, then became uniformly white, thickened and pervaded with blood-vessels. While the upper portion was clearing up, the inner, then the lower, and at last the outer edge of the quadrangular opening in the capsule became successively white and thickened. Hypopyon and repeated abundant hemorrhages took place. When he left, the exudation in the pupil was diminished, the shape and tension of the globe being normal.	34	$\frac{1}{\infty}$ F. complete.			
	8	$\frac{20}{70}$		$\frac{20}{30}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
46	Mrs. B. M. Ger. Newark, N. J.	55		Hard. Ripe.		March 1872.	Capsule cut out.	
47	C. S. Am. Or'nge N. J.	42		Hard. Ripe.		Mar., 1872.	Capsule cut out.	
48	S. L. Heb. N. Y. City	60		Hypermature		Feb. 1872.		
49	C. Bl. Ger. Adrian Mich.	56		Nuclear cataract. Cortex still semi-transparent in both eyes. (Immature.)		April, 1872.	Knife was blunt requiring a good deal of dragging and sawing.	After division of ant. capsule vitreous exuded without any pressure on the eye. Cataracts easily extracted with large spoon, a small quantity of vitreous followed. Wound closed well.
50	Mrs. M. M. Irish, Hoboken, N. J.	41		Disciform, old, (hyp'rmature.)		April, 1872.		Great pressure had to be employed to expel the lens, upon which a small quantity of vitreous escaped.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 14	$\frac{20}{100}$		$\frac{20}{40}$	
	14	$\frac{20}{100}$ Two m'ths later. $\frac{20}{20}$	Six months later V reduced by vertically striated secondary cataract. Division with Graefe's knife, a year after extraction resulted in	V. $\frac{20}{20}$ permanent.	
	11	$\frac{20}{100}$		$\frac{20}{30}$	
Cyclitis.—4th day, yellowish reflex from well dilated pupil. 10*th day:* synechiæ and pupillary membrane. 16: Hemorrhage in ant. cham. 19: more hemorrhage: iris bulging forward. 39th: Eye shrunken. Iris bulging. Perception of light faint, pain, which had been acute, disappeared.	39	$\frac{1}{\infty}$		0	
	11	$\frac{20}{70}$		$\frac{20}{30}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
51	M. L. Am. N. Y. City.	32		Soft.		April, 1872.		
52	C. B. Am. Stratford.	76		Hard. Ripe.		April, 1872.		
53	Mrs. F. M. Am. B'klyn N. Y.	58		Hard.	Inner lower quadrant of F. absent; nothing to account for it.	May, 1872.		Some blood and cortical substance left.
54 55	Mrs. U Am. N. Y. City.	78	Decrepit and childish.	Hard. Ripe. Both.		May, 1872.		Left eye: inner border of iris pushed out of wound by passing lens.
56	Mrs. C. A. Am. N. Y. City.	54		Hypermature		May, 1872.		
57	K. V. Ger. Jersey City, N. J.	42		Hard.		May, 1872.		
58	Mrs. M. W. Irish, N. Y. City.	56		Hard. Ripe.		May, 1872.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 6	$\frac{20}{200}$		$\frac{20}{30}$	
	11	$\frac{20}{200}$		$\frac{20}{30}$	Other eye unsuccessfully operated on 4 years previously.
From the fifth to the twelfth day conjunctiva injected and swollen. Opacity in centre and upper part of cornea, deepseated as if produced by scraping with the cystotome.	26	$\frac{20}{200}$		$\frac{20}{70}$	
L. Violent iritis: plug in pupil, hypopyon. After absorption dense pupillary opacity.	21	$\frac{20}{100}$ $\frac{1}{\infty}$		$\frac{20}{50}$ $\frac{5}{200}$	
	13	$\frac{20}{50}$		$\frac{20}{30}$	
	15	$\frac{20}{100}$		$\frac{20}{50}$	
Iritis. Dense pupillary membrane.	21	$\frac{10}{200}$	Iridectomy downward, not very successful: pseudo-membrane extending downward also. Division of membrane at first of	$\frac{10}{200}$ $\frac{20}{100}$ Permanent. (May 1876)	Other eye had been operated on before. Closure of pupil. V. $\frac{20}{100}$ by artificial pupil.

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
58		56				May, 1872.		
59	J. W. Ger. Newark, N. J.	62		Hard. Ripe.		June, 1872.		
60	T. G. Ger. N. Y. City.	72		Hard. Ripe.		June, 1872.		
61	J. D. Am. N. Y.	60		Hard. Ripe.	Left eye. Chronic Iritis.	June, 1872.		
62	S. M. Am. N. Y. City.	50		Hard. Ripe.		June, 1872.		
63	Mr. M. D. Ger. N. Y. City.	65		Hard. Ripe.		June, 1872.		Some vitreous escaped.
64	J. Ch. Heb. N. Y. City.	78		Hard. Ripe.		Oct. 1872.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS		little benefit; improvement later. Floating opacities in vitreous.		
Iritis; pupillary membrane. Prospects by after-operation very favorable.	16	$\frac{10}{200}$			Other eye operated on previously: phthisis bulbi.
Iritis. Pupillary membrane.	29	$\frac{2}{100}$	Discission with Beer's knife. Pupil perfectly clear.	$\frac{20}{70}$	
Iritis and keratitis suppurativa in both corners of wound. These corners incised. Pupillary membrane.	26	$\frac{1}{200}$	Division with Beer's knife 18 months later.	$\frac{20}{100}$	Had a good deal of irritation in both eyes, for months after his discharge. Left iridocyclitis absolute.
	11	$\frac{20}{100}$		$\frac{20}{20}$	
Iritis. Pupillary membrane. Iris drawn upward toward wound.	21	$\frac{5}{200}$	4 months after extr. triangular *iridotomy* with scissors, followed by panophthalmitis.	0	
	16	$\frac{20}{200}$		$\frac{20}{100}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
65	J. K. Am. N. Y. City.	56		Hard. Ripe.		Oct. 1872.		
66	Mrs. V. Fr. N. Y. City.	70		Hypermature.	Old posterior synechiæ.	Oct. 1872.		
67	Mrs. B. Am. Buff'lo, N. Y.	77		Hypermature.		Oct. 1872.		
68	N. K. Ger. N. Y.	49		Hard. Ripe.		Oct. 1872.		
69	Mrs. C. Am. Sussex Co. N. Y.	49		Hard. Ripe.		Oct. 1872.	Capsule removed.	
70	A. W. Ger. Hoboken, N. J.	28		Soft. Ripe.		Nov. 1872.		
71	Mrs. M. D. Irish, Hoboken, N. J.	40		Half-soft.		Nov. 1872.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 9	$\frac{20}{40}$		$\frac{20}{30}$	
	13			$\frac{20}{40}$	
	11	$\frac{20}{200}$		$\frac{20}{100}$	
	11	$\frac{20}{40}$		$\frac{20}{30}$	
Plastic capsulitis, beginning at upper border of capsule which became white and thickened. The inflammation travelled around, produced some synechiæ, but left centre of pupil free.	17	$\frac{20}{200}$		$\frac{20}{40}$ six we'ks $\frac{20}{20}$ (four years later.)	
	10	$\frac{20}{100}$		$\frac{20}{20}$	
	18	$\frac{20}{40}$		$\frac{20}{20}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
72	A. L. Heb. Montgom'ry Ala.	55		Hard. Ripe.		Nov. 1872.		
73 74	L. C. Am. N. Y. City.	44		Hard. Ripe, (both).		Nov. 1872.		
75	Dr. D. Ger. N. Y. City.	62		Hard. Ripe.		Dec. 1872.		
76	C. M. Am. N. Y. City.	69		Hard. Ripe.				
77	J. S. Ger. N. Y. City.	72		Hard. Ripe.		Jan. 1873.		
78	Mrs. C. D. Irish. N. Y. City.	63		Hard. Ripe.		Feb. 1873.		
79	H. K. Am. N. Y. City.	59		Hard. Ripe.		April, 1873.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 16	$\frac{20}{40}$		$\frac{20}{20}$	
R. eye. Spongy exudation, taking a favorable course. Some capsular opacities. *L. eye.* Plastic iritis. Closure of pupil.	13	$\frac{20}{200}$ $\frac{1}{8}$ F, c. Tn.		$\frac{20}{100}$	Returned 3 weeks after his discharge, having a relaspe of capsulitis with hypopyon in his right eye. Under antiphlogistic treatment recovered slowly. V $\frac{20}{200}$, and 2 months later V $\frac{20}{100}$.
	9	$\frac{20}{50}$		$\frac{20}{20}$	
	14	$\frac{20}{20}$		$\frac{20}{40}$	
	13	$\frac{20}{100}$		$\frac{20}{40}$	
	11	$\frac{20}{100}$		$\frac{20}{30}$	
	12	$\frac{20}{70}$		$\frac{20}{50}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
80	J. H. Ger. N. Y. City.	59		Hard. Ripe.		April, 1873.		
81	M. C. Irish. N. Y. City.	62		Hard. Ripe.		May, 1873.		
82	Mrs. F. Am. B'dge-port, Ct.	80		Hy-permature.		May, 1873.		Inner border of iris pushed into the wound and bruised by passing lens.
83	F. M. Ger. Carlstadt, N. J.	65		Morgagnian Hypermature.		May, 1873.		
84	Mrs. L. R. Am. N. Y. City.	57		Complicated.	Leucoma adhærens corneæ centrale.	May, 1873.		
85	S. S. Heb. N. Y. City.	43		Zonular congenit (Immature.)		May, 1873.		Pupil appeared clear, but showed cortical substance and a strip of capsule the next day.
86	D. C. G. Am. B'klyn N. Y.	61		Hard. Ripe.	Centre of anterior capsule thickened.	May, 1873.	Centre of ant. caps. circumcised came out with cataract.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Purulent Iritis. Panophthalmitis.	DAYS 14	0		0	
	12	$\frac{20}{200}$		$\frac{20}{40}$	
Purulent iritis, starting from inner border of coloboma. Panophthalmitis.	21	0		0	Other eye had been unsuccessfully operated on four years previously.
	18	$\frac{20}{100}$		$\frac{20}{40}$	
Iritis. Pupillary membrane.	11	$\frac{15}{200}$	Division four weeks after extraction. No reaction.	$\frac{20}{50}$	
Recurrent capsulitis and irido-cyclitis, leaving dense secondary cataract.	60	$\frac{1}{200}$	Iridectomy.	$\frac{2}{200}$	Eye remained irritable (irido-cyclitis) for two years, but never affected the other.
	12	$\frac{20}{40}$		$\frac{20}{30}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
87	Mrs. E. K. Am. Hoboken, N. J.	79	Excessively decrepit Skin like paper.	Hypermature.		May. 1873.	Section strictly peripheric.	
88	G. O. Ger. Savan-.nah, Ga.	60		Hard. Ripe.		June, 1873.		
89	H. H. Am. Atlanta, Ga.	58		Hypermature.		June, 1873.		
90	M. B. Ger. Philadelphia, Pa.	72		Hypermature.		June, 1873.		
91	V. W. Am. N. Y. City.	72		Morgagnian. Hypermature cum bursa.		June, 1873.		After the soft cortical substance and the hard nucleus had come out, a white bag showed itself in the pupillary space. It was pressed out with some effort by means of two spoons, a silver spoon keeping the lips of the wound apart, and a rubber spoon pressing on the

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
2d day: Wound open and slightly gaping. *3d day:* Suppuration in corners of wound. Panophthalmitis.	14	0		0	
	18	$\frac{20}{100}$		$\frac{20}{40}$	
	14	$\frac{20}{40}$		$\frac{20}{30}$	
	20	$\frac{20}{200}$		$\frac{20}{50}$	
	12	$\frac{20}{100}$		$\frac{20}{40}$	

No. of Case.	*Name. Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
91		72				June, 1873.		cornea and pushing the bag toward the section. The bag, apparently a recess of the capsule, burst, a milky fluid escaped, and the wrinkled bag remained at the upper border of the coloboma, leaving the centre of the pupil perfectly free (no accident)
92	Mrs. B. A. Ger. Rye, N. Y.	52		Hard. Ripe.		June, 1873.		
93 94	Mrs. B. F. Irish. N. Y. City.	60		R. Hypermature. L. Hard. Ripe.		June, 1873.		
95	Mrs. M. K. Ger. N. Y. City.	60		Hard. Ripe.		June, 1873.		
96	J. B. Am. B'klyn N. Y.	60		Hard. Ripe.		June, 1873.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 12	$\frac{20}{100}$		$\frac{20}{70}$	
	13	$\frac{20}{70}$		$\frac{20}{40}$	
Incarcerated iris in both eyes; causing no annoyance.	11	$\frac{20}{70}$ $\frac{20}{70}$	Jan. 1877 S. sunken to $\frac{10}{200}$ from pupillary membranes. Division by needle gave in 9 days	$\frac{20}{50}$ $\frac{20}{40}$	The prolapse of iris in right eye became red on 4th day, was excised. Recovery perfect.
	9	$\frac{20}{100}$		$\frac{20}{30}$	
	5	$\frac{20}{100}$		$\frac{20}{20}$	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
97	M. Span. N. Y. City.	37		Half-soft. Ripe.		July, 1873.		
98	C.P.S. Am. Springfield, Mass.	41	Excellent.	Ripe.		Sept. 1873.	Apex of section 1 mm. in cornea.	
99	A. B. Heb. Chicago, Ill.	69	Plethorical. Excitable.	Hard. Ripe.	Pupil moderately dilated by atropine. Eye myopic.	Sept. 1873.	Ap. of sect. touching transparent cornea. Wound enlarged with scissors.	A small quantity of cortex left.
100	L. N. Am. N. Y. City.	55	Feeble.	Immature. Swollen.		Sept. 1873.		Some lens and tough capsule remained in the pupil.
101	B. E. Ger. Maine.	54	Good.	Half-soft. Ripe.	Arc. senilis pronounced.	Oct. 1873.	Remnants of corticalis removed by considerable rubbing. Conjunctival flap.	A small piece of iris, caught in the inner corner of the wound, was cut off. (Accident.)

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations.*	*Ultimate V.*	*REMARKS.*
	DAYS 12			$\frac{20}{40}$	
	14	$\frac{20}{30}$		$\frac{20}{20}$	
Some irritation at corners of section where iris was adherent.	20	$\frac{20}{40}$	9 weeks after extraction division of sec. cataract with needle. No reaction.	$\frac{20}{40}$	A year later had hemorrhage into the vitreous, which left floating bodies and, at the time of discharge, V $\frac{20}{70}$.
Marked *spongy exudation.* Absorption on the fifth day. The gelatinous exudation looked like a dislocated lens, with a sharp somewhat ragged edge. Pupillary membrane.	20	$\frac{10}{100}$	6 weeks after extraction a crucial division of the pupillary membrane, producing a very clear pupil, and no reaction.	$\frac{20}{70}$ S'v'n we'ks after extr. Six days after division.	
Pain and mucous secretion. Conjunctiva raised. Inner corner of section whitish. From it white exudation (pus) descending tongue-like into ant. chamb. Iris discolored; aqueous turbid. This condition lasted a week, during	35	$\frac{12}{200}$	30 days after the extraction, when the irritation had almost disappeared, but a tendency to closure of the pupil and stretching of the iris was still manifest, a Beer's knife was thrust through	$\frac{20}{70}$ Thr'e we'ks after sec'n'd'ary operation.	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
101		54				Oct. 1873.		
102	N. H. Ger. Newark, N. J.	57	Good.	Hard. Ripe (nine years).	Myopic.	Oct. 1873.	Apex of sec. 1 mm. below margin of cornea.	
103	N. B. Am. Detroit, Mich.	54		Hypermature. Cholesterinic and chalky deposits.		Oct. 1873.	Apex of sec. 1 mm. below mar. Section large.	Tough capsule torn, but lens would not move on pressure. Extracted with *large spoon*. Thickened capsule removed with forceps.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
which time the wound was incised and the anterior chamber emptied every day. Then the inflammation gradually disappeared, leaving a dense pupillary membrane.	DAYS		the lower part of the cornea and upper part of the iris. The lower lip of the *iridotomy* wound was seized with a blunt hook, and drawn toward the wound, in order to be cut off, but it slipped off the hook. As a large opening appeared in the iris, through which vitreous passed into the ant. chamb., and even out of the corneal wound, no further attempt at iridectomy was made. Little reaction followed and patient was discharged six days later with a clear pupil.		
	14	$\frac{20}{200}$		$\frac{20}{70}$	
No reaction until the fifth day; then circumcorneal injection, hyperæmia of iris, haziness of pupil and vitreous. Eye tender. Irritation (*hyalitis*) gradually subsided.	40	$\frac{20}{100}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
104	Mrs. C. Am. N. Y. City.	78	Good.	Hard. Ripe.	Large arc. senilis.	Oct. 1873.		
105	Mrs. C. B. Ger. N. Y. City.	38	Phthisis pulmon.	Soft. Ripe.		Nov. 1873.		
106	J. W. H. Am. Boston, Mass.	39		Ripe.		Nov. 1873.		
107	L. R. Am. Syracuse, N. Y.	55		Ripe.			Quadrangular piece of capsule excised.	
108	J. W. Ger. Syracuse, N. Y.	66		Hypermature.	Myopic.	Nov. 1873.	Apex of sec. 1 mm. below corneal margin.	In cutting the iris, a small piece of the ant. lip of the section was cut.
109	Dr. J. M. Am. Oberlin, Ohio.	71		Hypermature.	Myopic.	Dec. 1873.	Capsule resisted Weber's double hook, therefore	Cataract extracted together with capsule by large spoon. Escape of vitreous.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 14	$\frac{20}{40}$		$\frac{20}{40}$ $2\frac{1}{2}$ y's later.	
On fourth day, *spongy exudation*, lasting five days. Portion of anterior capsule in pupil. Remainder of pupil clear.	13	$\frac{20}{200}$			
	17	$\frac{20}{40}$		$\frac{20}{20}$	
	15	$\frac{20}{50}$			
Slow closure of wound. Chemosis. Circumscribed purulent infiltration of wound; irritation gradually disappearing, leaving interior clear, but a part of the pupil filled with capsule.	36	$\frac{20}{40}$			
Recovery, without notable irritation.	21	$\frac{20}{40}$		$\frac{20}{40}$ 3 m'ths	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
110	N. A. P. Am. N. Y. City.	65		Hard. Ripe		Jan. 1874.	Apex of sec. 1½ mm. below margin.	
111	Dr. Br. Ger. B'klyn	73	Decrepit. Cough. Prostatitis.	Hard. Ripe.	Pupil dilated but little by atropia.	Jan. 1874.	Apex of sec. 2 mm. below margin.	
112	J. M. Irish, N. Y City.	49		Cataracta accret.	Leucoma adhærens from burns. Iridectomy had been made.	Jan. 1874.	Section inward.	
113	G. K. Ger. N. Y. City.	61	Asthma.	Ripe.		Feb., 1874.		
114	G. B. Irish, N. Y. City.	52		Cataracta accreta.	Kerato-iritis, with closure of pupil 5 yrs. previously. Iridectomy 1½ years previously. Trachoma and pannus one year.	Feb., 1874.	Section inward.	The rotten iris was drawn out by pieces and cut off
115	Miss J. W. Am. N. Y. City.	25	Anæmic.	Halt-soft. Ripe.	Maculæ Corneæ. Eye greatly sunken.	Feb., 1874.	Ap. of sec. 1½ below marg. Vitreous presented.	Lens extracted with the capsule. Considerable loss of vitreous. Eye collapsed.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Hemorrhage into anterior chamber on fourth day; absorbed in three days.	DAYS 15	$\frac{20}{100}$		$\frac{20}{40}$ 6 we'ks	
Slow healing of wound. Some capsular obstruction in pupil.	14	$\frac{20}{100}$			Five months after operation patient had a severe general disease, subacute irido-cyclitis. He died soon after.
	18	$\frac{10}{200}$		$\frac{10}{200}$	Result excellent considering the complications, especially the opacity of the cornea.
Violent fits of coughing. Inner corner of wound bulging. Slow closure.	11	$\frac{20}{200}$			
	23	$\frac{5}{200}$			Result all that could be expected. Vision improved by treatment of trachoma.
No reaction. Wound closed 3d day; reopened by injury the 4th, closed again the sixth. Pat. left with floating opacities in vitreous.	16	$\frac{20}{100}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
116	C. D. Ger. Hoboken, N. J.	56		Hard. Ripe.		Feb., 1874.		Wound had to be enlarged with scissors. (No accident.)
117 118	E. W. Negress, N. Y. City.	90		Hypermature, chalky, thickened capsule. (Both.)	Chronic Conjunctivitis	Mch., 1874.	Sect. a little below transparent margin.	
119	A. H. M. Hebrew, Milwaukee, Wis.	26		Soft Traumatic (3 years)	Good.	Mch., 1874.	Apex of sec. 3 mm below corneal margin.	Capsule resisted cystotome, therefore extraction with capsule. No introduction of instruments. No prolapse of vitreous.
120	Dr. St. Am: Staten Island, N. Y.	79	Decrepit.	Hypermature.		Mch., 1874.	Ant. Capsule freely lacerated and lens easily removed.	The *opaque* centre of post. capsule was torn with sharp hook, but could not be extracted on account of protruding vitreous.
121	Mrs. M. R. Am. N. Y. City.	45		Mature.		April, 1874.	Centre of capsule cut out.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
Iritis and capsulitis plastica, leaving pupillary obstructions.	35	$\frac{20}{100}$	Division by sickle-needle 13 weeks after extraction. No reaction. 5 days.	$\frac{20}{40}$	
Iritis leaving pupillary obstruction in both.	26	$\frac{5}{200}$ $\frac{10}{200}$		$\frac{5}{200}$ $\frac{15}{200}$ 6 we'ks	
Diffuse opacity of vitreous with circumcorneal injection from 3d to 15th day. One small synechia at inner angle of wound.	19	$\frac{20}{30}$		Excellent.	
Plastic capsulitis, producing a pupillary membrane.	37	$\frac{5}{200}$	3 months later iridectomy followed by hemorrhage. Discharged 6th day with	V $\frac{7}{200}$ later $\frac{20}{200}$	
	14	$\frac{20}{70}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
122	J. W. Am. N. Y. City.	70	Feeble	Cataracta accreta.	Recurrent iritis for years 20 years ago. Pupils closed. V. $\frac{1}{\infty}$ both for twenty years. Tn. Fc.	April, 1874.	Extraction R. Eye smooth. Counted fingers.	Some cortex left.
123	Mrs. E. P. Am. Westfield, Mass.	70		Hard. Ripe.		April, 1874.		
124	S. V. Negress, N. Y. City.	63	Bronchitis.	R. eye Hypermature		April, 1874.	Extraction with capsule. No introduction of instruments.	Escape of fluid vitreous.
125				L. eye Synchysis. (Complicated.)				Small section enlarged with scissors. Fluid vitreous escaped. Iridectomy made with great difficulty. Cataract extracted with hook. Some cortex left. About one-third of vitreous escaped. Eye collapsed.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS				
Reaction inconsiderable. Coloboma obstructed by remnants of capsule and lens.	20	$\frac{1}{200}$	6 months later irid'ctomy, yielding..... but revealing secondary cataract, which 3 weeks later was divided and depressed with Beer's knife. Recovered in 6 days	V $\frac{5}{200}$ $\frac{15}{200}$	
	30	$\frac{20}{70}$	10 months later division of wrinkled capsule. No reaction.	$\frac{20}{20}$ 2 y'rs later.	
Some floating opacities.	2	$\frac{20}{200}$			
3d day suppuration in the vitreous. Panophthalmitis; atrophy of globe.	32	0			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
126	Mrs. A. M. K. Am. N. Y. City.	50	Bronchitis. 20 yrs.	Hard. Ripe.		May, 1874.		Copious hemorrhage after iridectomy. The ant. chamb. emptied several times. A sponge was held on the wound for some time. (Accident.)
127	E. F. Heb. Baton Rouge La.	50		Half-soft. Ripe.		May, 1874.		
128	Mrs. J. B. Ger. N. Y. City.	64		Cataracta subluna-ta. (Complicated).		May, 1874.		After the section it was attempted to extract the lens by pressing it out with a curette applied to the outer surface of the cornea while keeping the wound open by depressing the posterior lip of the wound. The lens did not move. A sharp hook was then introduced, its point inserted into the lens from the posterior pole The cataract was readily drawn out, and the capsule followed with only one bead of vitreous.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Obstruction of pupil by pseudo-membrane.	DAYS 11	$\frac{10}{200}$	30 days after extraction, division of secondary cataract with falciform needle. Recovered in 5 days with	$\frac{20}{100}$	
	15	$\frac{20}{70}$		$\frac{20}{50}$ $2\frac{1}{2}$ y'r	
No reaction.	10	$\frac{20}{200}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
129	Mrs. M. M. Am. Brooklyn, N. Y.	36		Morgagnian (Hypermature.)		June, 1874.	After the rupture of the capsule the milky corticalis escaped into the ant. chamb. It was removed, as cleanly as possible, with the nucleus.	
130	P. T. Am. N. Y. City.	56		Hard. Ripe.		June, 1874.		
131	D.S.H. Am. N. Y. City.	80	Decrepit.	Cataracta cystica, of 40 years' standing. (Hypermature.)		June, 1874.	Extraction with capsule without introduction of instruments, followed by the escape of a small quantity of vitreous.	
132	M. B. Ger. N. Y. City.	58		Morgagnian. (Hypermature).	Very myopic.	Oct. 1874.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Mild iritis. Some synechiæ, and capsular opacities.	DAYS 16	$\frac{20}{40}$			
On the sixth day, hurt his eye violently. Wound ruptured. An. cham. filled with blood. Gradual absorption. Synechiæ and opacities of pupil.	28	$\frac{8}{200}$	5 months after extraction, division of sec. cat. with sickle needle. No reaction. 5 days.	$\frac{20}{100}$	
Suppuration and hyalitis, and iritis. Ant. chamb. and iris cleared up, but pupil remained occluded.	13	$\frac{1}{\infty}$ F. c.			
	19	$\frac{20}{100}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
133	M. B. Heb. N. Y. City.	51		Hypermature. Capsule thickened.	Always highly myopic.	Oct. 1874.		
134	J. O'N. Am. N. Y. City.	44		Hard. Ripe.		Oct. 1874.		
135	H. D. Am. N. Y. City.	63		Hard. Ripe.		Nov. 1874.		
136	J. M'C. Am. S. Sing, N. Y.	64		R. Hypermature.		Nov. 1874.	R. extraction with capsule.	R. A single drop of vitreous.
137				L. Hard. Ripe.				

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Bulging incarceration of iris in outer corner of wound abscinded, without emptying ant. chamber. No reaction.	DAYS 23	$\frac{20}{40}$	1½ years afterward, acute purulent iritis, (intense pain, pericorneal injection and impairment of S the first day; purulent disch. œdema of lids, chemosis, hypopyon, iris greenish, pupil plugged, $V\frac{1}{\infty}$ the second day. The prolapse was swollen, white, covered with adherent mucus. It was incised, the iris drawn out extensively and abscinded. Ant. chamb. emptied. From that moment, improvement ending in complete recovery. V=$\frac{20}{40}$.		
Small prolapse of iris at outer angle of wound.	12	$\frac{20}{40}$		$\frac{20}{20}$	
	14	$\frac{20}{40}$		$\frac{20}{20}$ (1½ year.)	
	18	$\frac{20}{40}$ $\frac{20}{100}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
138	E. E. Am. N. Y. City.	70		Hard. Ripe.		Nov. 1874.		
139 140	Mrs. W. S. Heb. Wm's-burg, N. Y.	60		Hard. Ripe, both.		Nov. 1874.		
141	L. C. Ger. Hoboken, N. J.	52	Nervous. Plethoric.	Hard. Ripe.	Eye very deep-set.	Nov. 1874.	Capsule cut out.	A few drops of *vitreous* after exit of lens by excessive pressure of patient.
142	J. P. Am. B'lington, N. J.	69		Hypermature		Nov. 1874.		Some remnants of cortex left.
143	H. P. Ger. Flatbush, N. Y.	64	Stout. Plethoric from drinking.	Hard. Ripe.		Nov. 1874.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Iritis with complete closure of pupil. Iris drawn upward.	DAYS 42	$\frac{2}{200}$	14 weeks after first operation, artificial pupil with Beer's knife and Tyrell's hook. Central, sharply defined pupil yielding S $\frac{15}{200}$. A thin membrane which spread across the pupil was divided four weeks later, yielding	$\frac{20}{40}$ and $\frac{20}{30}$ ($1\frac{1}{2}$ year.)	
After-hemorrhage in ant. chamber in both eyes, leaving in the right some pupillary opacity.	16	R. $\frac{20}{200}$ L. $\frac{20}{100}$		$\frac{20}{100}$ $\frac{20}{40}$ (4 mo.)	
Mild iritis.	28	$\frac{16}{200}$		$\frac{20}{100}$ (3 mo.)	
	19	$\frac{20}{100}$		$\frac{20}{40}$ (2 mo.)	
	13	$\frac{20}{100}$		$\frac{20}{20}$ ($1\frac{1}{2}$ yrs.)	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
144	L. S. Ger. Elizabeth, N. J.	64		Hard. Ripe.		Dec. 1874.		
145 146	Mrs. J. Heb. N. Y. City.	80	Stout. Decrepit.	Hypermature both.	Deep-set.	Dec. 1874.		Section small in both. Expulsion difficult. Some cortex left in both.
147	Mrs. P. Heb. N. Y. City.	60		Hard. Ripe.		Dec. 1874.		
148	R. V. Am. B'klyn, N. Y.	50	Had had articular rheumatism several times. (Complicated.)	Posterior synechiæ		Dec. 1874.	Extraction with capsule. No instrument introduced.	
149	Mrs. E. P. Am. Westfield, Mass.	65		Hard. Ripe.		Jan. 1875.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 20	$\frac{20}{100}$		$\frac{20}{30}$ (3 mo.)	
Purulent keratitis and panophthalmitis in both.	35	0 0		0 0	
Plastic iritis with closure of pupil.	36	$\frac{1}{\infty}$	Five months later, iridectomy with Beer's knife and Tyrell's hook. Central pupil yielding	$\frac{20}{50}$	
Hyalitis on fifth day. Iritis. Pupil obstructed; clearing up. In the third week attacked with acute articular rheumatism, on account of which he desired to be discharged. His eye was improving and showed	21	$\frac{5}{200}$			Patient died six weeks after his discharge.
	25	$\frac{20}{30}$		$\frac{20}{20}$ ($1\frac{1}{2}$ yrs.)	Other eye operated on before. (See case 123).

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
150	Mrs. M. M. Am. B'klyn, N. Y.	45		Half-soft. Ripe.		March 1875.		
151	Mrs. C. M. Am. Eliza-beth, N. J.	59		Hard. Ma-ture.		April, 1875.		
152	Mrs. M.A.S. Am. S. I. N. Y.	70		Hy-perma-ture.		May, 1875.		
153				Hard Ripe.				
154	Mrs. C. S. Am. N. Y. City.	50		Ripe. Large.		May, 1875.	Large section wholly in the limb. conjtv.	A small portion of iris near periphery fell before knife and was cut.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Mild Iritis.	DAYS 25	$\frac{20}{50}$			
	13	$\frac{20}{50}$		$\frac{20}{30}$ (2 mo.)	
	21	$\frac{20}{100}$ $\frac{20}{70}$		$\frac{20}{50}$ (5 mo.) $\frac{20}{30}$ (5 mo.)	
Purulent iritis from the second day. Wound opened. Ant. chamb. evacuated several times. Complete closure of pupil.	16	$\frac{1}{\infty}$		$\frac{1}{\infty}$	7 months later, cornea flat, indrawn scar, painful irido-cyclitis. Vision of other eye impaired, without physical changes, indicating sympathy. Antiphlogistic treatment. Inflammation soon ceased. Other eye healthy S $\frac{20}{20}$. No irritation since.

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
155	S. L. Am. Bridgeport, Ct.	50		Hard. Ripe.		May, 1875.		
156	L. C. Ger. N. Y. City.	52		Hypermature. Capsule thickened.	Myopic.	May, 1875.	Apex of section 1 mm. below corneal margin.	Lens extracted with capsule by means of a hook. Capsule burst, but the greater part of it was removed. A few drops of liquid vitreous escaped.
157	Mrs. M. M. Am. Brooklyn, N. Y.	55		Hard. Ripe.		May, 1875.		
158	J. F. Am. Fort Wayne Ind.	65		Immature. (Dark nucleus, cortical is semi-transparent, capsule opaque.		May, 1875.	Large section, centre of ant. capsule removed.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 14	$\frac{20}{40}$		$\frac{20}{40}$ (10 mo.) Tn $1\frac{1}{2}$ with $+\frac{1}{2\frac{1}{4}}$	Reads 6 to 7 hours a day without any annoyance. Other eye blind.
Reaction very moderate.	18	$\frac{20}{100}$			
Mild but very obstinate irido-hyalitis.	34	$\frac{20}{100}$		$\frac{20}{30}$ (6 mo.)	
Mild iritis.	36	$\frac{20}{40}$			

No. of Case.	Name, Nativity, Residence.	Age.	General Condition.	Quality of Cataract.	Condition of Eye.	Time of Operation.	Execution of Operation.	Incidents of Operation.
159	Mrs. C. G. Ger. Hoboken, N. J.	64		Hypermature.		June, 1875.		
160	F. D. Ger. N. Y. City.	39		Half-soft. Mature.	Both eyes prominent, somewhat hydrophthalmic.	June, 1875.		An extraordinary amount of liquid escaped after the completion of the section.
161	W. B. Ger. Brooklyn, N. Y.	60		Hypermature.		June, 1875.		A drop of vitreous escaped on removal of cortical remnants.
162 163	W. B. Am. N. Y. City.	76		Hypermature with thick. capsule, both.		June. 1875	Capsule cut out.	*R.* A drop of vitreous while last portion of cortex was removed. *L.* Vitreous presented while cortex was removed. It receded as soon as pressure of the globe was discontinued.
164	Mrs. A. Mc. G. Am. N. Y. City.	60		Immature. Corticalis semi-transparent.		Sept. 1875.	Section large. The tough capsule was ruptured with difficulty.	Exit of lens tardy. Visual test negative. Cortex left.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 19	$\frac{15}{100}$		$\frac{20}{50}$ (2 mo)	
	14	$\frac{20}{40}$			
Intense iritis.	46	$\frac{20}{40}$			
	14	R. $\frac{15}{100}$ L. $\frac{15}{40}$		$\frac{20}{50}$ $\frac{20}{20}$ (1 y'r).	
Purulent iritis.		1 ∞			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
165	Dr. L. Ger. N. Y. City.	54	Stout.	Mature.	Highly myopic.	Sept. 1875.	Capsule cut out.	
166	M. A. C. Am. N. Y. City.	60		Morgagnian. [Hypermature.]		Sept. 1875.		
167	Mr. A. Am. Greenpoint, N. Y.	80		Hard. Ripe.		Oct. 1875.		
168	Mrs. A. R. Am. N. Y. City.	60		Hard. Ripe.		Oct. 1875.		
169	F. P. Ger. N. Y. City.	54		Hard, and shrunken. Capsule irregular [Hypermature.]		Oct. 1875.	Lens removed in capsule by large spoon depressing posterior lip, and rubber spoon pushing lens out by pressing on cornea.	Escape of some vitreous.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 24	$\frac{20}{30}$		$\frac{20}{30}$ (4 mo.)	
Irido-cyclitis. Closure of pupil. Indrawn scar.	25	$\frac{1}{\infty}$		$\frac{1}{\infty}$	Ciliary region remained tender to the touch for ten weeks. No irritation of other eye.
Tardy closure of wound. No irritation.	16	$\frac{20}{40}$		$\frac{20}{20}$ (2 mo.)	
Slight iritis.	16	$\frac{20}{50}$		$\frac{20}{30}$ (9 mo.)	
No reaction.	15	$\frac{20}{100}$		$\frac{20}{40}$ ($2\frac{1}{2}$ mo.)	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
170	Miss E. A. Ger. Ct.	58		Hard. Ripe.	Dacryocystitis chronica.	Oct. 1875.	Extrac. ith capule.	
171	Mrs. Chs. Am.	54		Hyper mature Capsule thickened.		Nov. 1875.	Capsule cut out.	
172	A. S. Heb. N. Y. City.	65	Feeble	Cataracta accreta Former irido choroiditis.	Functional examination satissatisfactory	Nov. 1875.		Lens slightly dislocated by cystotome. Escape of vitreous.
173	Mrs. M. M. Am. N. Y. City.	60		Hard. Ripe. Catar. accret.	Posterior synechiæ. Functional examination normal.	Nov. 1875.		Bleeding in ant. chamb. Escape of vitreous.
174	S. W. Am. N. Y. City.	72		Hard. Ripe.		Nov. 1875.	Extraction with capsule.	
175	Mrs. H. M. Am. N. Y. City.	66	Exceedingly fat.	Catar. accret.		Nov. 1875.		Bleeding. Escape of vitreous.

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 16	$\frac{20}{70}$			The dacryo-cystitis was treated 5 days before the extraction with injections of sulph. zinci in the sac, which improved the condition greatly.
Mild iritis.	15	$\frac{20}{200}$		$\frac{20}{50}$ (3 mo.)	
Suppuration in vitreous. Great pain. Indrawn scar.	7	$\frac{1}{\infty}$		$\frac{1}{\infty}$	
Suppuration in vitreous. Anterior chamber opened once daily for five days. Pupil closed.	22	$\frac{1}{\infty}$		0	
	13	$\frac{20}{70}$			
Suppuration of vitreous. Pupil closed by yellow substance.	29	0		0	

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
176 177	Gen. U. Am. Long Island, N. Y.	72		R. Morgagnian. L. Hard. Ripe.		Jan. 1876.		
178	J. S. Germ. N. Y. City.	44		Ripe.		Feb. 1876.		Escape of a few drops of vitreous after expulsion of lens by an awkward movement of patient.
179	Mrs. G. W. Germ. N. Y. City.	65		Hard. Ripe.		Mar. 1876.		
180	Mrs. S. N. Am. N. Y. City.	67		Hard Ripe.		Mar. 1876.		
181	M. T. Am. Long Island, N. Y.	56		Hard. Ripe.		Mar. 1876.		
182	M. W. Am. N. Y. City.	66		Hard. Ripe.		Mar. 1876.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 21	$\frac{20}{40}$ $\frac{20}{70}$		$\frac{20}{40}$ $\frac{20}{40}$ (6 w'ks.)	
Some floating opacities in vitreous, when discharged.	16	$\frac{20}{50}$			
	8	$\frac{20}{40}$			
Mild iritis, leaving a few filiform synechiæ and a thin pupillary membrane.	23	$\frac{20}{40}$	Ten weeks later S $\frac{20}{200}$, the thin wrinkled capsule was split with Beer's knife, yielding	$\frac{20}{100}$	Sight changed considerably, and on examination retinitis albuminurica was discovered.
A small part of incarcerated iris in one corner of the wound is removed, though showing no irritation.	19	$\frac{20}{30}$		$\frac{20}{20}$ (6 w'ks. 9 mos.)	
	14	$\frac{20}{50}$		$\frac{20}{40}$ (4 w'ks.)	

No. of Case.	Name, Nativity, Residence.	Age.	General Condition.	Quality of Cataract.	Condition of Eye.	Time of Operation.	Execution of Operation.	Incidents of Operation.
183	O. N. Am. N. Y. City.	46		Hard Ripe.		Apr. 1876.		
184	I. S. Germ. N. Y. City.	48		Hard Ripe.		Apr. 1876.		
185	S. S. Heb. N. J.	48		Traumatic. (Complicated.)	Synechiæ Funct. exam. normal.	Apr. 1876.		
186	C. M. Am. N. Y.	60		Hard Pipe. (Complicated.)	Myopia. Extensive choroidal atrophies, seen after recovery.	Apr. 1876.	Section very large.	
187	Mr. G. Germ. N. Y. City.	64		Hard Ripe.		Apr. 1876.		
188	Mr. S. Ger. Phil. Pa.	76	Nephritis and Bronchitis chron.	Hard. Ripe.		April, 1876.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
	DAYS 20	$\frac{20}{30}$		$\frac{20}{20}$ (6 w'ks.)	
	14	$\frac{20}{30}$			
	14	$\frac{20}{100}$		$\frac{20}{40}$ (10 w'ks.)	
	21	$\frac{20}{200}$ with $+\frac{1}{4}$			
Irido-cyclitis, mild, but obstinate, with partial bulging of iris. Centre of pupil kept clear. Recovery, bulging disappeared.	33	$\frac{20}{100}$		$\frac{20}{30}$ (2 mos.)	
Iritis.	27	$\frac{20}{100}$			

No. of Case.	*Name, Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
189	Mrs. E. Ger. N. Y. City.	48		Hard. Ripe.	Myopic.	April, 1876.		
190	D. Ger. Union Hill, N. J.	70		Hard. Ripe. (Complicated.)	Highly myopic, hydrophthalmic eye. Other eye successfully operated on before showing extensive atrophic patches of choroid.	April, 1876.	In capsule.	Considerable loss of vitreous.
191	Mrs. S. Am. N. Y. City.	65		Hard. Ripe.		May, 1876.		
192	Mrs. H. Ger. N. Y. City.	76		Lens partially dislocated in anterior chamber (Complic't'd.)	Consecutive glaucoma acut.	May, 1876.	Lower section through cornea. No iridectomy. Exit of lens easy.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Iritis a week after operation.	DAYS 27	$\frac{20}{40}$ ($+\frac{1}{4}$)	2 months after operation, division of false membrane with Beer's knife. Yielding	$\frac{20}{40}$ 3 mos. later $\frac{20}{40}$	
Very tardy closure of wound on account of vitreous keeping a small portion of it gaping. The protruding little bead was cut off a few times. At last the wound closed.	32	$\frac{20}{200}$ without a glass.		$\frac{20}{70}$ Reads with $+\frac{1}{4}$ 3 mos.	Many atrophic patches of choroid. Opacities in vitreous.
	20	$\frac{20}{40}$		$\frac{20}{50}$ $1\frac{1}{2}$ mos.	
Central, round pupil.	6	$\frac{20}{40}$		$\frac{20}{40}$ 7 we'ks	Patient knew no cause of the dislocation. Stated that she had been blind 2 years. Of late the eye became inflamed.

No. of Case.	*Name. Nativity, Residence.*	*Age.*	*General Condition.*	*Quality of Cataract.*	*Condition of Eye.*	*Time of Operation.*	*Execution of Operation.*	*Incidents of Operation.*
193	Mrs. A. B. Ger. N. Y. City.	48		Hard. Ripe.		May, 1876.		
194	Dr. L. Ger. N. Y. City.	50		Hard. Ripe.	Myopic. Floating opacities of vitrea year before operation.	May, 1876.		
195	Mr. T. Ger. B'klyn N. Y.	78		Morgagnian (Hypermature.)		May, 1876.		
196	Mrs. J. Am. N. Y. City.	55		Hard. Ripe.		June, 1876.		
197	E. R. Ger. N. Y. City.	68		Hard. Ripe.		June, 1876.	Section small. Expulsion slow, but complete.	

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
On the third day iritis set in, 5th day pus in pupil and ant. chamber. 6th day infiltration of part of flap. Flap incised, anter. chamb. emptied. 7th, reopened, chamb. filled with blood. Then gradual absorption and clearing of pupil.	DAYS 25	I/8		$\frac{2}{200}$ 2 mos. $\frac{20}{200}$ 3 mos.	
	15	$\frac{20}{50}$		$\frac{20}{30}$ 5 we'ks	
	18	$\frac{20}{200}$		$\frac{20}{40}$ 4 we'ks	
	7	$\frac{20}{40}$			
	9	$\frac{20}{30}$			

No. of Case.	Name, Nativity, Residence.	Age.	General Condition.	Quality of Cataract.	Condition of Eye.	Time of Operation.	Execution of Operation.	Incidents of Operation.
198	Mrs. S. Ger. N. Y. City.	49		Hard. Ripe.		June, 1876.		
199	L. L. Ger. N. Y. City.	68		Hard. Ripe.		June, 1876.		
200	Mr. A. Ger. N. Y. City.	48		Hyper-mature.		June, 1876.		

Course of Healing Process and After-Treatment.	*Length of Treatment.*	*V. at time of Discharge.*	*After-Operations*	*Ultimate V.*	*REMARKS.*
Capsulo-iritis. Hypopyon. Afterward whole ant. chamber filled with yellowish bloody exudation, stationary for nine days, then gradually absorbing, leaving dense pupillary membrane.	DAYS 32	1/8	4 months later artificial pupil with Beer's knife. The corneal wound was small and it required some effort to withdraw Tyrell's hook. Artific. pupil small, clear; corneal wound irritated for two weeks.	20/200 6 we'ks	
	12	20/70		20/20 (4 w'ks.)	
	22	20/50			

From the foregoing tabular statement, the influence which different factors have on the result of the operations may be more or less conclusively derived. I shall successively consider these factors as follows.

I. NATIONALITY.

TABULAR STATEMENT.

Nationality.	*Number of Operations.*	*Results.**		
		Good.	*Moderate.*	*Failures.*
Americans,	88	73; 83%	4; 4.5%	11; 12.5%
Germans,	69	62; 89.8%	2; 3%	5; 7.2%
Hebrews,	20	15; 75%	1; 5%	4; 20%
Irish,	13	10; 77%	2; 15.3%	1; 7.7%
French and Spanish,	4	3; 75%	——	1; 25%
Negroes,	6	1; 16.2%	4; 66.6%	1; 16.2%
	200	164; 82%	13; 7.5%	23; 11.5%

This table shows a markedly reduced rate of success in the Hebrew and Negro nationalities, while in the others the differences of success are hardly marked enough to demonstrate more favorable conditions in the one than in the other nationality. The number of operations performed on Hebrews and Negroes was, however, too small to assume that cataract operations in these races offer a worse chance than in others. The four cases of failure in the Hebrew patients are accounted for by special causes: in *the first*, the operation was laborious, the lens was extracted with a spoon, and vitreous escaped; the *second* and the *third* referred to hypermature cataracts in a fat

* As *good* results are reckoned cases of S = $\frac{20}{20}$ to $\frac{20}{200}$.
As *moderate* results are reckoned cases of S = $\frac{19}{200}$ to $\frac{2}{200}$.
As *failures* results are reckoned cases of S < $\frac{2}{200}$.

and feeble woman of eighty years, who was fidgety and unmanageable. The expulsion of the lenses was difficult. The *fourth* case was a cataracta accreta in an eye which had suffered from irido-choroiditis.

In regard to the negroes I am not prepared to state that they, as a race, offer the same ratio of success as the whites. Operations in the negro, other circumstances being equal, seem to be followed by more irritative processes than in the white man.

II. AGE.

The influence which the *age* of the patients had on the final results is shown in the following table.

Age in Years.	*Number of Operations.*	*Results:*		
		Good.	*Moderate.*	*Failures.*
20 to 29	3	3; 100%		
30 to 39	10	10; 100%		
40 to 49	27	23; 85%	2; 7.5%	2; 7.5%
50 to 59	53	45; 85%	3; 5.6%	5; 9.4%
60 to 69	64	52; 81%	2; 3.4%	10; 15.6%
70 to 79	36	30; 83.3%	4; 11.1%	2; 5.6%
80 to 90	7	1; 14.3%	2; 28.6%	4; 57.1%

This table shows that up to the age of 40 years, all operations were followed by complete success. From 40 to 80 years, the percentage of good results remained almost the same, varying between 85 per cent and 81 per cent, whereas after 80 it abruptly sank to 14.3 per cent. If we disregard the column of the moderate results, and examine that of the failures, the age of the patients seems to have a decided influence on the results, so that the ratio of losses increases with advancing years, being 0% until the age of 39 years, 7.5% between 40 and 49 years, 9.4% between 50 and 59 years, 15.6% between 60 and 69 years, 5.6%

between 70 and 79 years, and 57.1% between 80 and 90 years. The table shows a steady increase of the failures from 40 to 69 years of age, but then there is a marked—evidently accidental—diminution during the years from 70 to 79, and again an extraordinary rise after 80 years. Half of the cases (5 out of 10) of failure in the years from 60 to 69 referred to complicated cataracts and impure operations. Each of the four cases of loss in patients from 80 to 90 years showed some accident in the operation; the first, introduction of a large spoon, and escape of vitreous; the second, escape of vitreous; the third and fourth, difficult exit of lens with remaining rests of cortex.

The two cases of moderate success referred to the two eyes of a negress (case 117 of the table), whose age could only approximately be ascertained. She was led to the clinique by an old man who showed her the greatest kindness. When we asked him how old his wife was, he answered: "She is not my wife, but my mother, and I am 70 or 71." Both operations were smooth, yet followed by adhesive iritis.

It seems not surprising that the chances of a successful cataract operation should diminish with advancing years. The older the person, the more the structure and function of his eyes must fall short of their standard in youth and vigorous manhood, since a multitude of unfavorable conditions surround even the most felicitously situated among us. In general, we may expect that the older the patients the more complications accompany the cataract, the more difficult and impure are the operations, the less speedy and complete is the recovery, the more unfavorable are the results. That this, as a general proposition, is true, I have little doubt, though the numbers in this and former reports are not large enough conclusively to show the deleterious influence of advancing years. We all have seen old people make easy and perfect recoveries from cataract extractions, but in what percentage of the cases does this occur? If we speak of the prognosis of cataract operations in old age, we should count all the cases as they come before us, and not exclude the complicated cases, since many of the complications are qualities inherent to old age; for instance, a relaxed condition

of the conjunctiva and probably of other coats of the eye. Senile involution, which is so conspicuous in many parts of the eye, is certainly an unfavorable factor in the prognosis of cataract operations.

III. QUALITY OF CATARACT.

I shall distinguish, as in former reports, four kinds of cataract: *mature*, *immature*, *hypermature*, and *complicated*. I have called mature all cataracts in which the opacification was complete, either soft cataracts or hard, or—which is very frequent—a hard nucleus surrounded by soft corticalis, the so-called cataracta semi-mollis, which word, in the table, I have literally translated with half-soft. The period of complete opacification is not always the most favorable to operate in, since the lens may be considerably swollen by imbibition. On account of the shallowness of the anterior chamber in this condition, the knife encounters two obstacles on its way: the bulging iris—and the anterior capsule. It is difficult to avoid the iris immediately after the puncture, and still more difficult before the counterpuncture is effected. Moreover, in the avoidance of these obstacles, we are apt to make the counterpuncture too far in front, in which case the section becomes irregular and too short. *Arlt* very justly remarks that this period of swelling by imbibition should have passed before the extraction is undertaken.

As *immature* cataracts are entered those in which the cortical substance was still more or less transparent. Such cataracts can seldom be cleanly removed, and only for very forcible reasons should their extraction be attempted. I have, like many others, been frequently punished for violating this rule.

Hypermature cataracts are those which show symptoms of disintegration, such as thickening of the capsule, white, fatty or milky-looking, chalky or crystalline patches. The majority of Morgagnian cataracts, and also the cystic cataract, are classified under this head, though many of them, especially the cystic variety, are complicated with diseases of the inner membranes.

As *complicated* cataracts I have entered only those in which some ocular disease of importance existed in conjunction with

the cataract; for instance, atrophic conditions of the iris, choroid, retina and optic nerve, synchisis, adherent leucoma, and so forth; whereas ordinary cases of myopia are not included, since they give no worse prognosis than the common cataract. One case of large zonular cataract (No. 85), in a man of 43 years of age, is entered as an immature cataract. The extraction had a poor result, and the long-continued iritis made me fear sympathetic ophthalmia, which, however, did not occur.

The following tabular statement shows the *influence of the quality of the cataract on the course of the operation and on the final results.*

Quality of Cataract.	*Number.*	*Operation:*		*Result:*		
		Smooth.	*With Accidents.*	*Good.*	*Moderate.*	*Failure.*
Mature,	128; 64%	112; 87.5%	16; 12.5%	114; 89%	4; 3.2%	10; 7.8%
Immature,	7; 3.5%	1; 14.3%	6; 85.7%	4; 57%	1; 14%	2; 29%
Hyp'rmat'e	48; 24%	30; 62.5%	18; 37.5%	40; 83.2%	4; 8.3%	6; 12.5%
Complica'd	17; 8.5%	7; 41.2%	10; 58.8%	8; 47%	4; 23.5%	5; 29.5%
TOTAL,	200; 100%	150; 75%	50; 25%	164; 82.5%	13; 7.5%	23; 11.5%

The first row shows a rather low figure for the simple, mature, uncomplicated cataract, namely, 64%, whereas the hypermature cataracts were relatively frequent, viz., 24%. The influence which the quality of cataract exerted on the course of the operation is clearly exhibited in the second and third rows. The operations for mature cataracts were accompanied with accidents in 12.5% of the cases, for hypermature cataracts in 37.5%, for complicated cataracts in 58.8%, and for immature cataracts with 85.7%. The final results of the operations show a similar proportion: 89% perfect results in mature cataracts, 83.2% in hypermature, 57% in immature, and 47% in complicated cataracts. The imperfect results and failures are the least frequent in mature cataracts; then follow, in the order of fre-

quency, the hypermature, immature, and complicated cataracts. The table shows that the immature cataracts yielded surprisingly unfavorable results, nearly as unfavorable as the complicated cataracts. This shows the great responsibility the operator takes on himself when, by inattention, indifference, weakness, or professional jealousy, he is led to extract an immature cataract. I make it a rule not to operate as long as, on ophthalmoscopic examination, the fundus yields a red reflex, however faint it may be; furthermore, as long as the patient is able to count fingers, after dilatation of the pupil, and as long as, by oblique illumination, in combination with a magnifying glass of great aperture, it can be ascertained that a part of the corticalis is still transparent. In such cataracts the semitransparent portions of the cortex adhere so tenaciously to the capsule that the most judicious and persevering efforts may fail to remove them. It is sometimes exceedingly difficult to withstand the entreaties of patients who have travelled hundreds and thousands of miles. They see hardly enough to walk about alone, and the operator, instead of telling them to go home again and wait till their cataracts are fully mature, is apt to listen and yield to their entreaties to operate at least on one eye. The result of such a proceeding is seen in the second horizontal column of the foregoing table. There were, it is true, only 3.5% of immature cataracts, but in 85.7% of them the operation was accompanied by unfavorable accidents, at the head of which was the leaving of a greater or less quantity of cortical substance in the eye. Only 57% of these eyes obtained good vision, 14% moderately good vision, and the failures have reached the high number of 29%. That I, however, am not the only one who, in this matter, yielded to temptation and fell, may be seen from the following example.

Some years ago, a German, about 55 years old, residing in Boston, wanted me to operate on one of his eyes. This eye suffered from a cataract the nucleus of which was completely opaque, but the outer layers of the cortex were translucent. A faint red reflex was gained from the fundus, and the patient could with this eye count fingers at a distance of three feet, while the vision of the other was still tolerably

good. I told him his cataract was not ripe, and he should wait. He did not wait, but sailed for Europe. Six months later, he came back to me with a letter from an excellent German oculist, exemplifying anew the old story. The patient had travelled over 3000 miles to have his cataract removed, and did not want to return to America with the cataract in his eye. The oculist yielded, the expulsion of the lens was laborious and incomplete; severe and prolonged iritis with closure of the pupil followed. When I saw the patient again, the eye operated on was collapsed and hopelessly blind.

While a student in London, I saw an excellent operator extract many an immature cataract. I expressed my astonishment, and he answered: "These people will be operated on. There is a keen competition in the city. If I send them away, telling them to wait, somebody else will operate on them." Such principles can, without damage to their reputation, be practised only by surgeons of hospitals, the old popularity of which covers, with the kind mantle of charity, many a sin of those "whose gratuitous services to the poor are inestimable," as the usual phraseology runs.

IV. CONDITION OF THE EYE.

Under this head there are some interesting observations noted. They do not easily admit of a statistical arrangement, but their nature and consequences can be conveniently studied by going over the general table.

V. THE TIME OF THE OPERATION

does not give rise to any remarks of importance. I have been taught that the hot season is unfavorable for cataract extractions. To this rule I have always adhered, and if I cannot demonstrate that the heat in itself is an unfavorable agent as to the healing of wounds of the eye, I can appreciate how unpleasant it must be, during the "heated term," to lie quiet, with bandaged eyes, from 4 to 7 days. Some of the patients who had been operated on in June, July, or August, were uncomfortable and restless from the heat, which, no doubt, had a bad influence on their cure.

VI. EXECUTION OF THE OPERATION.

A. *Instruments.*

The *knife* which I prefer is shaped like that of Lüer, but its surfaces are slightly concave, like those of a razor. I recommended these knives four years ago. They are unsurpassed in convenience, and their edge can be made sharper than that of the knives with flat surfaces (Lüer and others), and much more than those with convex surfaces (V. Graefe). They are perfectly reliable as concerns strength, and do not favor the escape of aqueous, as has, by theoretical reasoning, been pretended. I have given these knives a fair trial, and can repeat my recommendation.

Several forms of *iris-forceps* are in use. I have no preference for any one of them. The iris, which almost always protrudes, can be conveniently seized and secured with any kind of forceps, and it is a matter of practice with each operator to find out that form which will render him the best services.

I am very careful to have the *iris scissors* perfectly sharp and move evenly to the very point, so as to avoid the least bruising of the iris while cutting it.

I use Von Graefe's *cystotome* for the division of the capsule, and am very particular that its point and small cutting edge be of the utmost sharpness. An imperfectly sharp cystotome is apt to dislocate the cataract, and divide the capsule more in the way of tearing than of cutting. From numerous reactive processes of the capsule which I have closely watched and studied, I conclude that the capsule, like the iris, bears clean cutting well enough, but reacts unpleasantly on being torn with a blunt instrument.

For the expulsion of the lens I use a *hard-rubber spoon*, the blunt edges of which are pressed on the lower part of the cornea. (All my remarks refer to an upper section, unless a section in another direction be specially mentioned.) The edges of the spoon should be rounded and perfectly smooth; its form is indifferent. In the great majority of cases I press, during the passage of the lens, the posterior lip of the wound gently backward with a *broad silver spoon*. If the cataract cannot

be expelled in the usual way, and I am sure that the section of the cornea and the division of the capsule are sufficiently large, especially if the vitreous escapes, I introduce the same spoon slowly behind the cataract and extract it. A spoon *almost as broad as the lens* is the most reliable instrument in the so-called "accouchement forcé" of the cataract. If the cataract is hard, and cannot be removed by external pressure, a *sharp hook*, moderately curved and not too short, may be introduced behind the lens, implanted into the nucleus, and the lens thus drawn out.

B. *Mode of Operating.*

As regards the

Locality of the Section,

the experience gained by these last two hundred extractions tends to show that the advantages of a peripheric section, that is, one implicating the corneal tissue as little as possible, are more than counterbalanced by its dangers. Among these dangers I will mention the following: 1. It facilitates prolapse of vitreous, with all its injurious consequences; 2. It is more apt to produce incarceration of the iris and capsule of the lens than a corneal section; 3. Its reactive processes readily extend to the ciliary body, thus producing prolonged irido-cyclitis, and sometimes even sympathetic ophthalmia. My notes are not detailed enough to furnish numerical evidence of these propositions, but I have observed the facts, and they are deeply impressed on my mind. There was no instance of sympathetic ophthalmia in these two hundred cases, but such an example came recently under my observation, and the experience was terrible.

The main advantage of the peripheric section, as has always been asserted, consists in the greater immunity of the flap from sloughing. It was *Jacobson*, of Königsberg, who transferred the section from the cornea into the sclero-corneal juncture, because the tissue of the sclerotic has less tendency to suppuration than the cornea. He supported his recommendation by the results of 100 peripheric operations, of which he had lost only one eye. Jacobson's argument and practice have not been corroborated by more extensive experience. In the two hundred

extractions here under consideration, six cases of failure from primary suppuration of the flap were noted. In three of them—Nos. 9, 21, and 37—the section was strictly in the sclero-corneal juncture, being a regular Graefe's peripheric linear section, free from pathological complications and operative accidents. In the fourth—No. 6—the operation was smooth, the section peripheric, but small. In the fifth and sixth—Nos. 145 and 146—the section was peripheric, but small, and some cortex was left behind. We see that all the instances of primary suppuration of the flap occurred in cases where the section was peripheric. On the other hand, special notice is made of cases—Nos. 98, 102, 103, 108, 110, 111, 115, 119—in which the section encroached considerably, one to three millimetres, upon the transparent cornea, and in all of them there was no suppuration in the flap, and the results were good. If we consider these contrasting conditions as proof and counterproof, and attach no more value to them than the smallness of the numbers warrants, we may safely draw from them at least this inference: Suppuration of the flaps occurs as well after a peripheric as after a corneal section. Von Graefe also, in his later publications, lays less stress upon the peripherieity of the wound than upon its linear direction. Upon the same principle are based the methods of *Liebreich* and *Lebrun-Warlomont*.

The Size of the Flap

is of the greatest importance. It is self-evident that the larger a wound, the greater is the reaction from it, other things being equal. We should, therefore, make no section larger than the easy expulsion of the cataract in a given case requires. The mathematical rule that a distance of 9.5 millimetres between the internal points of puncture and counterpuncture is sufficient for the ready exit of the largest cataract, has led to an operative technique which is minutely described in text-books and pamphlets, and need not here be repeated. But since, in shaping a section, we cannot measure it with mathematical accuracy, it will happen that the section becomes either too large or too small, and of these two errors the latter is infinitely the worse. All authors who write from personal

experience dwell on the numerous dangers of an insufficiently large section, and though I have always fully appreciated these dangers, there is in these last two hundred cases a certain number (4) where the section was noted as being too small, and the loss of the eye was attributed to this defect.

The *Excision of the Iris*,

the second step of the operation, was always made large and with particular care to avoid *incarceration of the iris* in the corners of the wound. And yet, when, after the completion of the operation, no iris could be detected in the wound, and even when the sphincter edges were clearly visible in the anterior chamber, it has happened that some days later a small prolapse of iris made its appearance. The unpleasant consequences of these angular incarcerations have been pointed out by many operators. My experience on the course which these prolapses may take is as follows.

1. A great number of them have no marked effect on the healing of the wound, nor on the result of the operation, and *remain permanently quiet.*

2. Many others *cause irritation:* injection and swelling of the tissue around the corner of the wound, turbidity of the aqueous, plastic iritis, pupillary membranes. Sometimes a cystoid scar forms around them, and remains, for a long time, subject to relapses of acute inflammation, lasting between 4 days and a week. I have not seen that glaucoma develops from this condition. To avoid any injurious consequences arising from these small incarcerations of iris, I have of late always removed them as soon as they showed any inflammatory irritation. This I did as early as three days after the extraction, and at any period afterward, whenever they became troublesome. The little operation is easy, and I have never seen any bad results from it. With a Graefe's knife I freely split the conjunctiva which covers the prolapse, seize the iris with a pair forceps, draw it out as far as possible, and cut it close to the sclerotic. The aqueous humor always escapes. When the imprisoned iris is markedly raised, it may be better to cut it away as any other small staphyloma, but it will be necessary to remove, with a forceps, all

the iris that is left in the wound. Incarcerated iris of many years' standing need not detain us from performing operations for secondary cataract, should any such become advisable. On a case of that kind I operated only a few weeks ago. The two eyes of an old lady, Mrs. B. Fife—Nos. 93 and 94 of the table—had been operated on three years and a half previously with good result. Two months ago she returned, complaining that, of late, she could not see so clearly as at first. Thin, irregularly dense membranes spread across both pupils, and the vision was reduced to $\frac{1}{200}$. In each eye there was a small prolapse of iris in one corner of the wound. That of the right was about as large as a pin-head, that of the left was smaller. Through both pupillary membranes a crucial incision was made with a broad sharp needle. No reaction in the eyes; pupils splendid. On the third day, the prolapse of the right eye and its surroundings began to be red and a little raised. This condition was a little more pronounced on the fourth day. I, therefore, removed the protruding iris in the manner above described, and in 4 days all irritation was over, S. was $\frac{20}{50}$ in the right and $\frac{20}{40}$ in the left eye.

3. In some cases *purulent iritis* occurs a long time after the operation. Dr. Steffan described such a case. (Report of his Ophthalmic Institution, 1873 to 1874.) A woman of 63 years of age had been operated on for cataract by Von Graefe's method with excellent result, but iris was inclosed in one corner of the wound. Two years and four months later the eye was destroyed by spontaneous purulent irido-cyclitis, the cause of which, as Dr. Steffan alleges, was the incarceration of the iris.

A similar case came under my care last year, in which the impending destruction of the eye was averted by immediate removal of the prolapse. As the case seems to be of great importance, both as to the pathology and therapeutics of the conditions under consideration, I will report it in detail.

James O'Neil, of New York, æt. 44, in Oct., 1874, had been operated on his right eye for cataract, according to Von Graefe's method (Case 134). A small prolapse of iris at the outer corner remained, causing no disturbance. The vision at the time of his discharge from the Hospital

was $\frac{2}{70}$, and soon increased to $\frac{2}{20}$. Several times, after an exposure, his eye was a little red and sensitive, but always became well again in a day or two. On Jan. 26th, 1876, however, he took a severe cold by wetting his feet. In the night he felt intense pain in his eye, which continued during the next day, with rapid diminution of sight. I saw him at 8 P.M. on Jan. 27th, that is, 30 hours after the exposure. His eyelids were red and greatly swollen, the conjunctiva chemotic, and there was copious, hot, sero-purulent discharge. The prolapse of iris and the surrounding tissues were swollen and yellowish-white. The iris was greenish, the pupil narrowed and completely plugged by a yellowish dull substance; the aqueous was turbid; there was hypopyon of two millimetres in height. The tension was increased, and the vision reduced to mere perception of light. I was convinced that the incarcerated iris, acting like a foreign body, was the starting point of the purulent iritis. The inflammation, I imagined, produced in the prolapse similar conditions as we witness in strangulated hernia. Believing that only the immediate removal of the imprisoned and inflamed part could save the organ, I at once went home, called my assistant, Dr. A. Alt, and with him performed the operation, half an hour later. The swollen prolapse was freely incised, seized with the forceps, drawn forward, and cut away. The anterior chamber was emptied. I applied the ordinary flannel-charpie bandage, and ordered instillations of atropia. The patient felt at once relieved. His pain had disappeared. He passed a good night. When I saw him the next morning, the swelling of the lids had diminished, the hypopyon had disappeared, the chemosis and the plugging of the pupil were as the day before; the wound was whitish infiltrated; the tension of the globe had become normal; sight no better. During the next two days the symptoms somewhat abated. I ordered five leeches to the temple, and a thorough aperient. The fourth day no œdema of lids, pupil still cloudy, Tn, S $\frac{1}{\infty}$; wound bulging; but patient felt comfortable, and the discharge was purely serous. From that time the improvement progressed steadily; the wound collapsed, and the pupil gradually cleared up from the sides. On the 7th of February, the prolapse had disappeared, the wound was closed, the anterior chamber had its natural depth. The patient could count fingers at the distance of half a foot. There was still intense circumcorneal injection, and the iris still looked dull and discolored. I again ordered the application of leeches to the temple. From the 9th, there was a steady subsidence of all the symptoms. The

pupil became black, the sclerotic white again. On February 19th, twenty-three days after the operation, he could count fingers at the distance of three feet; on March the 2d, at twenty feet; on March the 23d, S was $\frac{20}{100}$ and $\frac{20}{40}$. Four weeks later, that is, three months after the operation, it was $\frac{20}{40}$, and his eye was free from all irritation. A slight pupillary opacity was left. The cataract in his other eye was then removed (case 183), resulting in S=$\frac{20}{30}$ after two weeks, and $\frac{20}{20}$ after six weeks. He has had no annoyance from either eye since.

The case is certainly one of the most suggestive of the whole series.

The *Division of the Capsule*

was always done with a cystotome, the point of which was passed first along one side of the remainder of the natural pupil and its extension, then along the other side, and the periphery of the capsule behind the coloboma. The cystotome was then pushed again to the lower edge of the pupil, slightly turned, so as to grasp the circumcised quadrangular piece of capsule and extract it. Sometimes the little piece of capsule was on the point of the instrument, and could, by the microscope, be identified. When the centre of the capsule was thickened, and, after its circumcision, did not come out on the point of the cystotome, it was extracted with a pair of delicate forceps. In the majority of cases the circumcised piece of capsule came out together with the cataract. Even if we did not find it, its absence from the eye could be demonstrated afterward by oblique light, which rendered the edges of the capsular defect quite conspicuous.

The reactive processes on the part of the lacerated capsule, to which I have always paid a good deal of attention, are quite frequent, and in some cases very serious. They shall be spoken of hereafter.

The *Expulsion of the Lens*

was effected by pressing with a rubber spoon on the lower edge of the cornea, at first directly toward the centre of the globe, then following the passing cataract so as to evacuate, if possible, nucleus and cortex together. During this time I facilitated the opening of the wound by gently pressing the posterior lip backward, while an assistant steadied the globe with a pair of

fixing forceps. When I found that the capsule was freely divided and the exit of the cataract retarded by an insufficient section, I enlarged the wound at one corner with a strong and sharp pair of strabismus scissors.* Sometimes the conjunctival flap is an obstacle to the ready slipping out of the lens, and should, in such cases, be incised with scissors.

The *Removal of Remnants of Cortical Substance*

was always effected by rubbing with the lids in the well-known manner; never was a Daviel's spoon or any other instrument introduced into the eye for that purpose. I prefer leaving some cortex in the eye to attacking it with a spoon. My experience from the days when I used a Daviel's spoon has been that those remnants which I was not able to remove by rubbing, could also not be removed with the spoon. I dread scraping the interior of an eye, however gently people tell you they can do it. Sometimes a piece of thickened capsule, with some lens matter adherent to it, was, after the exit of the cataract, removed with a pair of Mathieu's forceps.

In eleven cases the

Cataract was removed together with the Unbroken Capsule.

This procedure, I think, is indicated when the suspensory ligament is torn or frail, as in tremulous and certain hypermature cataracts, which may be recognized by a hydrophthalmic condition of the globe, abnormal depth of the anterior chamber, slight dislocation of the lens. In some cases the former condition of the eye, if known by previous examination, for instance high degrees of sclero-choroiditis, synchisis corporis vitrei, furthermore the comparison with the other eye, and so forth, will aid the diagnosis. In such cases I make the section very large and less peripheric than usual, in order to avoid or restrict, as much as possible, the prolapse of vitreous. In one case the lens was removed with a large spoon; in the ten others, the crystalline body was removed without the introduction of a traction instrument. After the section had been completed and the

* There are more bad strabismus scissors in the world than good ones, and it is not quite easy to find such as will answer the requirements of enlarging a cataract section without bruising.

iridectomy made, the eye being steadied with fixing forceps by an assistant, I held the posterior lip of the wound backward with a large spoon, and expelled the lens in the usual manner, by pressure upon the cornea from below upward. The results of these operations, considering the unfavorable conditions of the cases, were rather satisfactory. One eye was lost, in another the vision obtained was moderate ($\frac{5}{200}$), in the nine others it was good. The following synopsis will afford an easy review of these rather difficult cases.

No. 109. Pat. 71 years. Capsule resisted Weber's double hook. Lens with capsule extracted by large spoon. Escape of vitreous. Reaction slight. S $\frac{20}{70}$.

No. 115. Pat. 25 years. Cataract half-soft. Vitreous presented after iridectomy. Lens with capsule extracted, considerable loss of vitreous. No reaction. S $\frac{20}{100}$.

No. 119. Pat. æt. 26. Extr. with capsule. No prolapse of vitreous. No reaction. S. $\frac{20}{30}$ after 19 days.

No. 124. Negress, æt. 60. Escape of vitreous after exit of lens. Healing without disturbance. Floating opacities in vitreous. S $\frac{20}{200}$ in 32 days.

No. 131. Decrepit person, æt. 80. Cystic cataract of 40 years' standing. Prolapse of a moderate quantity of vitreous. Suppurative iritis and hyalitis. Occlusion of pupil. Perception of light only preserved. *Failure.*

No. 136. Patient 64 years of age. Cataract hypermature. Escape of a single drop of vitreous. No reaction. Vision $\frac{20}{70}$, 18 days after operation.

No. 148. Pat. aged 50, of Brooklyn. Subject to articular rheumatism. No accident during operation. Iritis and hyalitis set it on fifth day; improving in third week. A new attack of articular rheumatism in third week. Discharged on 21st day with S $\frac{5}{200}$. *Result moderate.* Patient died of rheumatism six weeks afterward.

No. 169. Pat. aged 54. Cataract hard and shrunken; capsule irregular. Slight prolapse of vitreous. No reaction. S $\frac{20}{100}$ at time of discharge, 15 days after operation; $\frac{20}{40}$ two months later.

No. 170. Pat. aged 58; chronic dacryo-cystitis. No accident. No reaction. S $\frac{20}{70}$ at discharge.

No. 174. Pat. æt. 72. Cataract hard, ripe. No accident, no reaction. S $\frac{20}{40}$ at discharge.

No. 190. Pat. aged 90. Hydrophthalmic eye. Considerable loss of vitreous. Very tardy closure of wound, S $\frac{20}{200}$ without a glass, 32 days after extraction; $\frac{20}{40}$ two months later. Reading glass + $\frac{1}{7}$. Extensive atrophic patches of choroid, and floating opacities in both eyes.

INCIDENTS DURING THE OPERATION, AND THEIR CONSEQUENCES.

Among the 200 operations 150, that is 75%, were perfectly smooth and without any unusual features. In 97, that is in 65%, of these 150 smooth operations, recovery took place without any inflammatory or other disturbance.

The primary results of the 150 smooth operations were 127 good results, 15 moderate results, and 8 failures. Of the 15 moderate results 8 were, by after-operations, converted into good results, and one into a failure. Of the 8 failures (*i. e.*, S $\frac{1}{\infty}$) two were converted, by after-operations, into good results, so that the final statement of the 150 smooth operations was as follows:

Good results: 136 eyes, *i. e.*, 90.6%.
Moderate results: 7 eyes, *i. e.*, 4.7%.
Failures: 7 eyes, *i. e.*, 4.7%.

Of the 200 extractions 50, that is 25%, were anomalous, *i. e.*, accompanied with accidents. In 12 of them, that is in 24%, the recovery was undisturbed by inflammation or irritative reaction of any kind.

The primary results of the 50 anomalous operations were: good 23, moderate 10, failures 17. After-operations converted 1 failure into a moderate, and 5 moderate into good results, so that the final statement of the complicated operations was:

Good results: 28 eyes, *i. e.*, 58%.
Moderate results: 6 eyes, *i. e.*, 10%.
Failures: 16 eyes, *i. e.*, 32%.

If we put these numbers together in a table, a comparison will show, at a glance, how much the rate of success is lowered by accidents during the operation.

Operations.		*Recovery:*		*Results:*		
		Smooth.	*Disturbed.*	*Good.*	*Moderate.*	*Failures.*
Smooth,	150; 75%	97; 65%	53; 35%	136; 90.6%	7; 4.7%	7; 4.7%
With accidents,	50; 25%	12; 24%	38; 76%	28; 56%	6; 12%	16; 32%
TOTAL,	200; 100%	109; 54.5	91; 45.5%	164; 82%	13; 7.5%	23; 11.5%

This statement of 4.7% of failures after smooth operations, and 32% after operations accompanied by accidents, would be a severe verdict against the operator, were *all* the accidents *his* fault. Some of the accidents are unavoidable, or almost unavoidable; for instance, hemorrhage from the iris, or into the vitreous (no example in our present series of cases), the numerous more or less prejudicial incidents and manœuvres intrinsically connected with the removal of hypermature and complicated cataracts, as the introduction of traction instruments with all their bad consequences. The extraction with the capsule, for certain cataracts the least hazardous operation, is almost always accompanied by loss of vitreous. In the preceding tables are counted even the slightest incidents during the operation that could possibly have any influence on the cure. That they may be compared with other publications the basis of which is different, I will put them together in groups, and add such remarks as appear of interest and importance.

Synopis of Incidents during the Operation.

1. In case 154, a part of iris near the periphery *fell before the knife* and was cut off. Lens large. Purulent iritis. S $\frac{1}{\infty}$.— Cutting of a central part of the iris is commonly done without much harm; cutting of a peripheric part may be more dangerous, since the iris is pressed against the hard sclerotic and into the wound. I would, in such cases, try to extend the iridectomy beyond the bruised part of the iris.

2. In case 126, *unusually copious hemorrhage* followed the iridectomy. It was finally arrested by emptying the anterior chamber, in pressing upon the cornea with a blunt instrument, while a sponge was held on the wound. Pupillary membrane. S $\frac{0}{200}$. Discission. S $\frac{20}{100}$. I am particular in removing blood from the anterior chamber. It makes the subsequent steps of the operation uncertain, thus giving rise to accidents.

3. In 3 cases the *capsule was opened by the knife* on its passage through the anterior chamber. All did well.—As this opening is commonly insufficient, it should be enlarged with the cystotome after the iridectomy.

4. In case 108, a small *part of the anterior lip of the wound* was cut away in cutting the iris. The wound united slowly, and there was partial infiltration of the cornea. Though the result was good, the reaction showed that the accident was not indifferent, and that we should be careful to avoid it.

5. In case 32, a good deal *of rubbing of the lids over the cornea*, in order to remove remaining cortex, led to purulent infiltration of the edge of the flap. A moderate degree of rubbing is commonly done without bad consequences, and is certainly less injurious than to try to remove the remnants with a Daviel's spoon.—Result good.

6. Case 114. *Degenerated iris drawn out piecemeal and cut off.* Cataracta accreta. Trachomatous pannus. S $\frac{25}{200}$. Operative result excellent.—It is known that a cornea suffering from pannus has little tendency to slough.

7. In 3 cases—55, 82, 101—a *part of the iris, bordering on the coloboma, was pushed out of the wound by the passing lens, and evidently bruised.* Violent iritis followed in each case. In one (82), S=0; in the other (55) S $\frac{1}{\infty}$, later $\frac{5}{200}$; in the third S $\frac{12}{200}$, raised by an early iridectomy to $\frac{20}{70}$.—I make it a rule in such cases to extend the iridectomy, after the exit of the lens, so as to remove the bruised part of iris.

8. In 4 cases—19, 120, 128, 158—the lens was extracted with *a sharp hook.* In all of them *prolapse of vitreous* occurred. In

two there was no reaction, in the other two the reaction was moderate. S good in 3 cases; moderate in 1.

9. In 6 cases—1, 17, 34, 49, 103, 109—the lens was extracted with *a large spoon*. In one—103—it was done without loss of vitreous, in the other five vitreous escaped. In one—109—there was only slight irritation; S $\frac{20}{70}$. In the second—17—the union of the wound was tardy; S $\frac{20}{70}$. In the third—103—hyalitis set in on the 5th day, getting well, with S $\frac{20}{100}$. In the fourth and fifth—1, 49—destructive irido-cyclitis ensued; S $\frac{1}{\infty}$, S 0. In the sixth—34—the union of the wound was very slow, a bead of vitreous held the wound gaping for 6 weeks. It was touched with nitrate of silver 6 times without much reaction. On the seventh touching, purulent hyalitis set in, followed by phthisis bulbi. Occasional clipping of the prolapsed vitreous with the the scissors, and persistent bandaging seem to be the proper treatment of such cases.

Half the cases, in which a large spoon was used, were lost. In former years I made similar experience. I, therefore, employ the spoon only as a last resort.

10. In 4 cases—6, 125, 145, 146—the *section was too small*, making the further steps of the operation difficult and impure. In No. 6 considerable rubbing had to be done to remove the tenacious cortex. Ring-abscess and panophthalmitis followed. In Nos. 145 and 146, the smallness of the section made the expulsion of the lenses difficult and unclean, cortical matter remaining behind. Panophthalmitis in both. In case 125 fluid vitreous escaped immediately after the small section; the lens was drawn out with a sharp hook, some cortex remaining. Panophthalmitis. These four cases exemplify the injurious effect of an insufficient section in its worst light, but there are many cases in which comparatively little and even no damage is done to an eye by a small section. A healthy eye bears an incredible amount of injury, witness the great number of traumatic cataracts, where small, irregular, and often lacerated wounds of the cornea with prolapsed iris lead to absorption of the lens with astonishingly slight reaction. But cataractous eyes are not healthy eyes, they bear less injury, and, therefore,

the surgeon's constant endeavor should be to extract the lens with as little injury as possible, and since experience shows that an insufficient section entails a multitude of dangerous conditions, it is one of the greatest, if not the greatest, fault an operator for cataract could commit.

11. 9 cases (3, 21, 24, 42, 53, 85, 99, 100, 150, 164) were noted in which more or less *cortical substance remained in the eye.* Two of them (164 and 21) were lost by purulent iritis and keratitis. The others showed more or less intense reaction, but recovered good sight, except a case of zonular cataract (85), in which irido-capsulitis produced dense false membranes which, after an iridectomy, yielded only S $\frac{2}{200}$.

12. *Prolapse of vitreous* was the only or gravest accident in 16 cases (28, 50, 63, 115, 124, 131, 136, 141, 161, 162, 169, 172, 173, 175, 178, 190). In 7 there was no reaction, and sight was excellent. In 3 cases floating opacities, with good vision, were noted. In 1 case iritis and a pupillary membrane gave vision only $\frac{5}{200}$; in another, intense iritis was well cured with S $\frac{20}{100}$. In the remaining 4 cases suppuration in the vitreous ensued with loss of sight. Besides these 16 cases, there was loss of vitreous in 10 others where it was accessory to accidents mentioned before, such as extraction of the lens with a hook or spoon. There were, on the whole, 13% of the operations complicated with escape of vitreous. This, however, should not be mentioned as a drawback to Graefe's operation, nor does it argue personal carelessness or lack of skill, since prolapsus vitrei is almost an inherent incident to certain operative procedures, for instance, the extraction together with the capsule. If we deduct the cases (9 in number) in which the extraction with the capsule was originally decided upon and performed accordingly, only 8.5% should be mentioned as complicating Graefe's operation.

For the sake of a comprehensive review of the incidents of the operation and their consequences, I will put them in a tabular statement.

Nature of Accident.	*No. of Eyes.*	*Recovery:*		*Result:*		
		Smooth.	*Disturbed.*	*Good.*	*Moderate.*	*Failure.*
1. Peripheric part of iris fell before knife and was cut off,	1		1			1
2. Copious hemorrhage after iridectomy	1		1	1		
3. Capsule opened by knife,	3	2	1	3		
4. Part of anterior lip of wound cut away with iris scissors,	1		1	1		
5. Unusual degree of rubbing to expel cortex,	1		1	1		
6. Degenerated iris drawn out in pieces and cut off,	1		1		1	
7. Iris bruised by passing lens,	3		3	1	1	1
8. Lens extracted with sharp hook (prolapse of vitreous in all),	4	2	2	3	1	
9. Lens extracted with large spoon (loss of vitreous in 5),	6		6	3		3
10. Sec. too small (loss of vitreous in 1),	4		4			4
11. Cortical substance left in eye,	9	1	8	5	2	2
12. Escape of vitreous (not mentioned previously),	16	7	9	11	1	4
TOTAL,	50	12	38	29	6	15

The study of the

REACTIVE PROCESSES

which follow the extraction of cataract are of particular importance, and I may, therefore, be allowed to describe them more in detail than I did in my former reports. In the following tabular statement I have put together, in sixteen groups, all the anomalous features in the course of healing that had been noted in the cataract journal. I have not mentioned such as are of normal or almost normal occurrence, and do not influence the result, such as the ordinary striped keratitis, slight circumcorneal injection from hyperæmia of the iris leaving no synechiæ, nor the non-inflammatory thin obstructions of the pupil dependent on imperfect removal and wrinkling of the capsule, nor injection and swelling of the conjunctiva, if it occurred in an eye otherwise recovering without disturbance.

The *anomalous reactive processes, their relative frequency, and the visual results* which they yielded, may be seen in the following table.

Nature of Reactive Processes.	*Frequency.*	*Results :*		
		Good.	*Moderate.*	*Failure.*
I. Tardy closure of wound,	7	6		1
II. Reopening of wound,	4	4		
III. After-hemorrhage into the anterior chamber,	6	6		
IV. Cystoid scar,	3	1	2	
V. Incarceration of iris,	4	4		
VI. Deep-seated keratitis,	1	1		
VII. Simple iritis,	21	17	2	2
VIII. Spongy iritis,	5	5		
IX. Simple capsulitis,	5	4	1	
X. Simple hyalitis,	6	5	1	
XI Cyclitis and irido-cyclitis,	5	1	1	3
XII. Partial suppurative keratitis	6	5		1
XIII. Total suppurative keratitis	4			4
XIV. Purulent iritis,	8	1	1	6
XV. Purulent capsulitis and capsulo-iritis,	2	1		1
XVI. Suppurative hyalitis,	5			5
TOTAL,	92	61	8	23

The sum total shows that almost half the cases (46%), were followed by some reactive process or other. Many of them were insignificant, and did not materially interfere with a good recovery. I have arranged the different groups in such a way that the severer forms follow the milder, the severest—the suppurative inflammation—occupying the last place. The table may give some estimate of the relative danger connected with the different reactive processes, and on that account be of use to the practitioner in framing the prognosis, and directing the treatment of the reactive processes here described. The visual result does not, however, solely depend on the nature of the reactive processes, but on the quality of the cataract, the incidents of the primary and the success of the after-operations. The dependence of these conditions upon one another, and a short description of the disturbances of the healing process in each case, arranged according to the groups in the preceding table, will be found in the following tabular statement, which is intended to afford easy reference and facilitate the study of the reactive processes following Graefe's extraction, for which reason some repetition will, I trust, be pardoned. The numbers in the second column refer to the general table, where more information may be found, if desired.

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
		I. Tardy Closure of Wound.					
1	17	No irritation.	Hypermature. Thickened capsule.	Extraction with spoon. 1 or 2 drops of vitreous.	$\frac{20}{100}$		
2	34	Part of wound held open by a small bead of clear vitreous. From 12th to 36th day 7 times touched with nitrate of silver; six times it produced no irritation, the seventh was followed by suppurative hyalitis.	Complicated.	Escape of fluid vitreous. Spoon.	$\frac{20}{70}$		0
3	111	No irritation.	Hard, ripe.		$\frac{20}{100}$		
4	113	Inner corner of wound bulging after violent fit of coughing.	Ripe.		$\frac{20}{30}$		
5	115	Wound closed on 3d day, reopened on 4th, closed on 6th. Floating opacities in vitreous.	Half-soft	Extr. with capsule. Escape of vitreous.	$\frac{20}{100}$		
6	167	No irritation.	Hard, ripe.		$\frac{20}{40}$		$\frac{20}{20}$
7	190	Very tardy closure, by intrusion into the wound of transparent vitreous which was repeatedly cut.	Complicated.	Escape of vitreous.	$\frac{20}{200}$		$\frac{20}{70}$
		II. Reopening of Wound.					
1	3	*Hut* eye on 11th day, wound ruptured, closed again in 2 days without irritation.	Hard, ripe.	Cortex and blood remained.	$\frac{10}{200}$		$\frac{20}{40}$

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
2	5	*Spontaneous* reopening on 3d day, closed again the following night.	Hypermature.		$\frac{20}{70}$		
3	42	*Traumatic* rupture of wound on 7th day, followed by escape of vitreous, but no bad consequences.	Complicated.	Some cortex left.	$\frac{20}{100}$		$\frac{20}{70}$
4	130	*Hurt* eye violently on 6th day, rupture of wound; hemorrhage into anterior chamber, gradually absorbed. Synechiæ and pupillary membrane.	Hard, ripe.		$\frac{8}{20}$	Discission.	$\frac{20}{100}$
		III. After-Hemorrhage into the Anterior Chamber.					
1	13	Pat. hurt his eye, on 3d day, while bandage was changed, hemorrhage into anterior chamber, disappeared in a few days.	Hard, ripe.		$\frac{20}{50}$		
2	31	Hem. on 4th day; absorbed in six days.	Hard, ripe.		$\frac{20}{40}$		
3	35	Hem. on 5th day. Absorption. Irido-cyclitis 4½ years later.	Hypermature.		$\frac{20}{70}$	Division of wrinkled capsule, 18 months.	
4	110	Hem. on 4th day, absorbed in 3 days.	Hard, ripe.		$\frac{20}{70}$		
5	139	Hem. in both eyes; followed in right by thin pupillary membrane.	Hard, ripe, both.		$\frac{20}{200}$		$\frac{20}{100}$
6	140				$\frac{20}{100}$		$\frac{20}{40}$
		IV. Cystoid Scar.					
1	14	Cystoid scar in innner corner of wound, causing no irritation.	Immature.	Capsule opened with knife.	$\frac{20}{200}$	Discission.	$\frac{20}{40}$
2	39	Slow healing, cystoid protrusion of scar, synechiæ, pupillary obstruction in both eyes of an old negress.	Hypermature (both).		$\frac{6}{200}$		
3	40				$\frac{15}{200}$		

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Results. S.*
		V. Incarceration of Iris.					
1	93	Iris imprisoned in one corner of wound, causing no annoyance.	R. Hypermature. L. Hard, ripe.		$\frac{20}{70}$	Division of sec. cataract 3½ years later.	$\frac{20}{30}$
2	94				$\frac{20}{20}$		$\frac{20}{40}$
3	133	Imprisoned prolapse of iris in one corner of wound, causing irritation of iris, was cut off on 5th day. Rapid recovery.	Hypermature.		$\frac{20}{20}$		
4	134	Small incarceration, causing acute suppurative iritis 18 months after operation. Eye saved by immediate removal of imprisoned iris.	Hard, ripe.		$\frac{20}{20}$	Removal of prolapse.	$\frac{20}{40}$
		VI. Deep-seated Keratitis.					
1	53	The posterior layers of the upper and central parts were opaque. Possible cause scraping with cystotome.	Hard.	Blood and cortex left.	$\frac{20}{200}$		$\frac{20}{70}$
		VII. Simple (plastic) Iritis.					
1	58	Leaving dense pupillary membrane.	Hard, ripe.		$\frac{10}{200}$	Iridectomy.	$\frac{20}{100}$
2	59	Pupillary membrane. (Prospects of secondary operation very good).	Hard, ripe.		$\frac{10}{200}$		
3	60	Dense pupillary membrane.	Hard, ripe.		$\frac{2}{200}$	Division.	$\frac{20}{70}$
4	63	Pupillary membrane.	Hard, ripe.	Escape of vitreous.	$\frac{5}{200}$	Triangular iridotomy with scissors. Panophthalmitis.	0

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
5	74	Closure of pupil.	Hard, ripe.		$\frac{1}{\infty}$ F. + complete.		
6	84	Pupillary membrane.	Complicated.		$\frac{15}{200}$	Division.	$\frac{20}{30}$
7	99	Some synechiæ.	Hard, ripe.	Some cortex left.	$\frac{20}{70}$		$\frac{20}{40}$
8	117	Pupillary obstructions in both.	Hypermature (both).		$\frac{5}{200}$	Division (both).	$\frac{5}{200}$
9	118				$\frac{10}{200}$		$\frac{15}{200}$
10	129	Mild iritis. No sequels.	Morgagnian.		$\frac{20}{20}$		
11	134	Closure of pupil.	Hard, ripe.		$\frac{2}{200}$	Iridectomy.	$\frac{20}{30}$
12	141	Mild.	Hard, ripe.	A few drops of vitreous.	$\frac{16}{200}$		$\frac{20}{100}$
13	147	Closure of pupil.	Hard, ripe.		1 ∞	Iridectomy.	$\frac{20}{60}$
14	150	Mild iritis.	Half-soft		$\frac{20}{50}$		
15	158	Mild iritis.	Immature.		$\frac{20}{70}$		
16	161	Intense iritis.	Hypermature.		$\frac{20}{70}$		
17	168	Mild.	Hard, ripe.		$\frac{20}{30}$		$\frac{20}{30}$
18	171	Mild.	Hypermature.		$\frac{20}{200}$		$\frac{20}{50}$
19	180	Mild. Thin pupillary membrane.	Hard, ripe.		$\frac{20}{70}$		
20	188	Mild.	Hard, ripe.		$\frac{20}{100}$		
21	189	Iritis. Set in a week after extraction.	Hard, ripe.		$\frac{20}{70}$	Division.	$\frac{20}{70}$

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
		VIII. Spongy Iritis.					
1	20	Spongy exudation on 3d day, absorbed in 10 days.	Soft, ripe.		$\frac{20}{100}$		$\frac{20}{30}$
2	41	Spongy exudation; Iritis; slight synechiæ.	Hard, ripe.		$\frac{20}{200}$		$\frac{20}{50}$
3	73	Spongy exudation. Absorption leaving some capsular opacities. Three weeks after his discharge capsulitis with hypopyon. Recovery.	Hard, ripe.		$\frac{20}{200}$		$\frac{20}{100}$
4	100	Marked spongy exudation. Absorption began on the 5th day; pupillary membrane.	Immature.	Cortex & tough capsule remain'd	$\frac{10}{200}$	Crucial incision.	$\frac{20}{70}$
5	105	Spongy ex. on 4th day, lasting 5 days.	Half-soft		$\frac{30}{200}$		
		IX. Simple and Plastic Capsulitis.					
1	23	Plastic capsulitis. Blood in pupil. Pupil large.	Hard, ripe.		$\frac{10}{200}$		Prospect good.
2	69	Plastic capsulitis, travelling around edges of coloboma, leaving centre of pupil free.	Hard, ripe.		$\frac{30}{200}$		$\frac{20}{20}$
3	116	Plastic irido-capsulitis; pupillary membrane.	Hard, ripe.		$\frac{20}{100}$	Division.	$\frac{20}{40}$
4	120	Plastic capsulitis; pupillary membrane.	Hypermature.	Removal of part of anterior, laceration of posterior capsule.	$\frac{5}{200}$	Iridectomy.	$\frac{10}{200}$
5	126	Irido-capsulitis; pupillary membrane.	Hard, ripe.	Unusual hemorrhage after iridectomy.	$\frac{10}{200}$	Division.	$\frac{20}{100}$

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After Operations.*	*Final Result. S.*
		X. Simple Hyalitis.					
1	105	Opacity of vitreous, first visible on 5th day; slow, but good recovery.	Hypermature.	Extraction with large spoon; no escape of vitreous.	$\frac{20}{100}$		
2	119	Diffuse opacity of vitreous. Perfect recovery.	Soft.	Extraction with capsule.	$\frac{30}{30}$		
3	124	Diffuse and formed (floating) opacities in vitreous. Recovery from inflammatory symptoms in 30 days.	Hypermature.	Extr. with capsule.	$\frac{20}{200}$		
4	148	Opacities in vitreous distinct on 5th day. Iritis subsequently. Pupillary obstruction.	Complicated.	Extr. with capsule. No instrument introduc'd. No escape of vitreous.	$\frac{5}{200}$		
5	157	Mild, but very obstinate (34 days) irido-hyalitis.	Hard, ripe.		$\frac{20}{100}$		$\frac{30}{30}$
6	178	Floating opacities in vitreous when discharged.	Ripe.	Escape of a few drops of vitreous.	$\frac{20}{50}$		
		XI. Cyclitis and Irido-cyclitis.					
1	1	Very painful hyalitis and irido-cyclitis. From 5th to 10th day +T1; after six weeks eye quiet. —T1.	Hard, ripe.	Escape of vitreous. Extraction with large spoon.	$\frac{1}{\infty}$		$\frac{1}{\infty}$
2	49	Cyclitis. 4th day: yellowish reflex from well-dilated pupil. 10th day ·	Immature.	Knife blunt; escape of	$\frac{1}{\infty}$		0

Consecutive Numbers.	No. of Case in General Table.	Nature of Reactive Processes.	Quality of Cataract.	Incidents of Operation.	Primary Result. S.	After-Operations.	Final Result. S.
		synechiæ. 16th day hemorrhage into anterior chamber; 19th day: hemorrhage repeated, iris bulging. 39th day: eye shrunken.		vitreous. Extrac. with large spoon.			
3	85	Recurrent capsulitis and irido-cyclitis. Iris uneven. Dense secondary cataract.	Zonular cataract in person 43 yrs. old.	Transparent cortex left.	$\frac{1}{200}$	Iridectomy.	$\frac{3}{200}$
4	166	Irido-cyclitis. Closure of pupil. Indrawn scar.	Morgagnian.		$\frac{1}{\infty}$		
5	187	Irido-cyclitis. Iris in one place considerably bulging. Centre of pupil remained clear. Bulging disappeared.	Hard, ripe.		$\frac{20}{100}$		$\frac{20}{60}$
		XII. Partial Suppurative Keratitis.					
1	21	Purulent infiltration of corneal edge of wound. Slow iritis. Closure of pupil.	Hard, ripe.	Cortex left.	$\frac{1}{\infty}$		
2	32	Partial suppurative keratitis. Iritis.	Hard, ripe.	A good deal of rubbing.	$\frac{20}{200}$		$\frac{20}{70}$
3	33	Severe partial suppurative keratitis. Absorption. Iritis. Dense pupillary membrane.	Hard, ripe.		$\frac{6}{200}$	Iridectomy.	$\frac{20}{40}$
4	61	Purulent infiltration of cornea in both corners of wound. Iritis. Pupillary membrane.	Hard, ripe.		$\frac{1}{200}$	Division.	$\frac{20}{100}$
5	101	Partial kerato-iritis. Tongue-like plug of pus descended from inner corner of wound into anterior chamber. Inflammation 35 days. Dense pupillary membrane.	Half-soft	A small piece of iris, caught in inner corner of wound, cut off.	$\frac{12}{200}$	Iridotomy (on 30th day).	$\frac{20}{70}$

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operation.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
6	108	Part. suppur. keratitis, mild. Slow closure of wound.	Half-soft	Part of edge of flap cut with scissors.	$\frac{20}{70}$		
		XIII. Total Suppurative Keratitis.					
1	6	*Ring-abscess.* Panophthalmitis. Phthisis bulb.	Hard, ripe.	Section small. Considerable rubbing to expel cortex.	0		
2	9	Suppuration of cornea beginning at inner corner of wound. Flat leucoma (phthisis anterior).	Hard, ripe.		0		
3	37	Suppuration began at edges of wound 2d day; *ring-abscess* 3d day; panophthalmitis. (The other eye operated on 15 months previously. Recovery and vision good.)	Hard, ripe. (General health good).	(A very smooth Graefe's operation. Immediate visual result excellent.	0		
4	87	Suppuration of cornea beginning in corners of wound. Panophthalmitis.	Hypermature. (Patient æt. 79, decrepit).	(Peripheric regular section).	0		
		XIV. Purulent Iritis.					
1	55	Violent iritis; plug in pupil; hypopyon. Dense pupillary membrane.	Hard, ripe.	Inner border of iris pushed out by passing lens.	$\frac{1}{\infty}$		$\frac{20}{70}$
2	80	Purulent iritis. Panophthalmitis.	Hard, ripe.		0		

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operations.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
3	82	Purulent iritis, starting from inner border of coloboma. Panophthalmitis.	Hypermature.	Inner border of iris pushed into wound & bruised by passing lens.	0		
4	145	Purulent irido-keratitis and panophthalmitis in both.	Hypermature (both).	Section small, expulsion difficult. Cortex left behind, in both eyes	0		
5	146				0		
6	154	Purulent iritis. Complete closure of pupil.	Ripe, large.	Small peripheric part of iris bruised and cut by cataract knife	$\frac{1}{\infty}$		$\frac{1}{\infty}$
7	164	Purulent iritis.	Immature.	Expulsion difficult. Cortex left.	$\frac{1}{\infty}$		
8	193	On 3d day: iritis; 5th day: pus in pupil and anterior chamber; 6th day: infiltration of part of flap. Gradual absorption.	Hard, ripe.		$\frac{1}{\infty}$		$\frac{20}{200}$
		XV. Purulent Capsulitis and Capsulo-iritis.					
1	44	Suppurative and hemorrhagic capsulitis, beginning at upper edge of capsule travelling all around. Repeated hemorrhages. Hypopyon. Closure of pupil. Tn.	Hard, ripe.	A quadrangular piece of capsule cut out, as usual.	$\frac{1}{\infty}$		

Consecutive Numbers.	*No. of Case in General Table.*	*Nature of Reactive Processes.*	*Quality of Cataract.*	*Incidents of Operations.*	*Primary Result. S.*	*After-Operations.*	*Final Result. S.*
2	198	Capsulo-iritis, purulent and hemorrhagic. Gradual absorption. Dense pupillary membrane.	Hard, ripe.		$\frac{1}{\infty}$	Iridectomy.	$\frac{20}{200}$
		XVI. Suppurative Hyalitis.					
1	125	On 3d day suppuration in vitreous. Panophthalmitis. Atrophy of globe.	Complicated.	Extraction with hook. Considerable loss of vitreous.	0		
2	131	Suppurative hyalitis and iritis. Pupil closed. F complete.	Cystic, of 40 y'rs duration.	Extraction with capsule, without introduction of instruments.	$\frac{1}{\infty}$		
3	172	Suppuration in vitreous. Great pain. Indrawn scar.	Complicated.	Escape of vitreous.	$\frac{1}{\infty}$		
4	173	Suppuration in vitreous. Pupil closed.	Complicated.	Escape of vitreous.	$\frac{1}{\infty}$		
5	175	Suppuration in vitreous. Pupil closed by yellow substance.	Complicated.	Escape of vitreous.	0		

The foregoing table may suggest many reflections, but as it speaks for itself, I shall content myself with the following:

I. Of the seven cases in which a *slow union of the wound* is noted, four were distinguished by escape of vitreous during the operation. The best mode of treatment seems to be to keep the eye closed by a compressive bandage until the union is effected. In case conjunctival irritation forbids the permanent closure of the lids, the bandage may be removed for several hours during the day, or during the night, and reapplied in the morning.

If vitreous protrudes through the wound, either as a transparent or a whitish mucoid substance, it seems best to cut it off with a pair of scissors, in order to remove from the wound the foreign substance which keeps it gaping, and when protruding exerts, during the movements of the eye, a certain degree of injurious traction. Touching the prolapse of vitreous or the ununited part of the wound with caustics seems highly objectionable, a fact emphatically illustrated by case 34.

All the cases, except the one just mentioned, recovered. That in many cases of slow closure of the wound—three to six or more days—no reaction follows is well known, yet I consider such a condition not only as anomalous, but as decidedly less favorable than the closure in the first or second night, and cannot in this point agree with Prof. *O. Becker*,* who thinks "that the delayed restoration of the anterior chamber is almost a favorable condition as to the final result." If the section closes soon after the operation, the wounded internal parts are protected from all external prejudicial influences, and the recovery under such conditions seems to me a great deal easier than with an open wound, just as an uncomplicated fracture presents a better prognosis than one that is complicated. Though I think that the dangers from the *infectious* qualities of the atmosphere and the conjunctival secretion have of late been very much exaggerated, I believe that foreign substances of any kind act injuriously on all wounds of the eyeball, since in

* Pathologie u. Therapie des Linsensystems, in *Graefe-Saemisch's Cyclopedia.* Vol. v., p. 361.

the eye, healing by first intention is almost indispensable for a good recovery.

According to these views I conduct the after-treatment. The patient is kept as quiet as possible, until the wound is permanently closed. During the first day or two no visitors, no conversations, no reading to him, no physical exertion are allowed. If he is restless, anodynes are administered. If I discover a low tendency of the wound to unite, by finding either the lint wetted or a stream of "tears" (aqueous humor) running from the eye when the bandage is changed and the eye cleansed, I do not open the lids—unless in addition there be pain or œdema and discharge. I sometimes keep the bandage unchanged for 24, 36 or 48 hours. Under these circumstances, I think that a limited rehabilitation of the old custom of a permanent bandage after the operation is good practice.

II. The *reopening of the wound* was notoriously the result of a hurt in three cases out of the four which are noted in the book. I have always been of opinion that the sudden and unexpected evacuation of the anterior chamber after the third day, in a regular course of healing, was mostly the result of an injury. The patient strikes his eye against a pillow, or unconsciously rubs it in his sleep. To prevent such an accident, I, in common with others, take the precaution of loosely tying the hands of the patient during the night, whenever he is restless, or complains of itching in his eye. The rupture of the wound, in an otherwise favorable case, is not a serious complication.

III. *After-hemorrhage into the anterior chamber* was noted in six cases (3%), all of which did well. I do not know what, in some cases, produces this after-hemorrhage, nor does the same occurrence after operations on other parts of the body throw any light on the subject. If we speak of a peculiar predisposition, it should be defined, and, if possible, pointed out before the operation. I would then make the section less peripheric, to avoid vascularized tissue. We all consider a perfect dilatability of the pupil by atropine as a favorable condition. If the dilatation is effected by the contraction of the muscular coats of the

blood-vessels, an eye whose pupil is imperfectly dilated by atropine suffers from atrophy or paralysis of this muscular coat; and a certain degree of passive congestion must be present. That such eyes are more than others predisposed to inflammatory reaction, in particular to purulent iritis, seems generally admitted, and I have seen it illustrated by many examples in my own experience. But I shall, in future, direct my attention particularly to the question whether such eyes are or are not more predisposed than others to primary (during the operation) and secondary hemorrhages.

IV. *Cystoid scar* was noted in 3 cases ($1\frac{1}{2}\%$) only. The one was an immature (swollen) cataract, in a woman of 42 years of age, the other two were hypermature cataracts in an old negress. I know nothing about the conditions that lead to the formation of a cystoid scar. There was no symptom of glaucoma in any one of the three eyes so affected.

V. *Incarceration of iris in the scar* is mentioned in four cases (2%), but occurred more frequently. In two cases only it caused irritation, in the one soon after the extraction, in the other 18 months later. I think it is good practice to remove the imprisoned iris whenever symptoms of irritation manifest themselves, as in case 133. The other case (134) in which purulent iritis set in has been above fully discussed.

VI. *Plastic iritis*—21 cases, $10\frac{1}{2}\%$—is the most frequent morbid process after extraction. It led in two cases to complete closure of the pupil with preservation of the shape and tension of the globe, and good perception of light. In the one case (147) iridectomy yielded a perfect result (S $\frac{20}{50}$), in the other (74) iridectomy offered the same chances, but the patient did not reappear. In the great majority of these cases a judicious after-operation will not fail to convert moderate into good results. In one of our cases (63), the eye which had S $\frac{5}{200}$, was destroyed by an iridotomy. The treatment of iritis was the ordinary antiphlogistic treatment of non-traumatic iritis, and proved, in general, very satisfactory. In these cases, careful observation of the eye soon after the operation, leading to the early discovery of iritis, saves many an eye.

VII. A peculiar form of iritis which, some time before the first cases were described, I demonstrated to my class, under the name of *spongy iritis* or *spongy exudation*, was noted in 5 cases ($2\frac{1}{2}\%$). This form is not peculiar to eyes operated on for cataract. I have seen it after operations for glaucoma, and in spontaneous, either syphilitic or non-syphilitic, iritis. *O. Becker* gives a—rather insufficient—description of it.* It is identical with the lens-like exudation of *H. Schmidt*† and the gelatinous exudation of *Dr. Gunning*.‡

Commonly on the third or fourth day after the operation œdematous swelling of the edge of the upper lid and lachrymal region with more or less chemosis sets in. There is moderate, sometimes intense pain. The secretion is watery, or sero-mucous, never purulent. The episcleral injection is marked. In the pupillary space appears a spongy-looking, semi-transparent substance of exceedingly fine, irregularly interlaced filaments, of grayish color, sometimes with a yellowish tinge. It increases during one or three days and may fill the anterior chamber either partially or totally. If it occupies the *whole anterior chamber*, it greatly diminishes the vision, sometimes to mere perception of light, the pupil is clouded and the iris very dull—apparently infiltrated, in reality, however, only covered—and this dullness may be mistaken for diffuse opacity of the cornea. On the third, fourth, or fifth day, the irritative symptoms suddenly disappear, the pain ceases, the swollen conjunctiva collapses, and a process of contraction seems to take place in the exudation. The grayish substance shows sharp edges, around which the periphery of the iris is seen in its normal lustre, and the mass itself looks like a compact, grayish, semi-transparent body, resembling a crystalline lens, dislocated into the anterior chamber, and for such it has, in cases of spontaneous spongy iritis, been mistaken. From day to day the grayish

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* L. c., p. 358, lines 4 to 22.

† Zeh. Klin. Monatsbl. f. Augenhl. 1871, p. 96.

‡ Zeh. Klin. Mon. 1872, p. 7. See also: *E. Grüning:* Spongy Exudation. These ARCH. III. p. 20. *C. J. Kipp:* Syphilitic Iritis with Gelatinous Exudation. These ARCH. III. p. 71.

compact mass becomes smaller, a part of the pupil, and at last the whole pupil, becomes free and clear. This process of absorption may last from three to ten days.

The cases where the exudation fills only *a part* of the anterior chamber are more frequent, but less characteristic. The area of the pupil and its immediate surroundings are occupied by a grayish substance, which in the first day or two has a spongy appearance, then becomes compact, and shows the same sharp edges as the larger masses. By its contraction and absorption, first a part of the pupil becomes free and black, and gradually the whole pupil is disengaged and clear. The irritative symptoms are less severe than in the forms in which the whole anterior chamber is filled.

In *spontaneous* spongy iritis the exudation may also fill the anterior chamber either partially or totally. The exudation begins commonly at the lower part of the iris, and may, when the pupil is dilated with atropine, be characteristic from the outset. The lower part of the anterior chamber is hazy, gray, frequently with a yellowish tinge, and the lower part of the pupil is occupied by an irregular network of coarser filaments which by oblique light and a large lens may be distinctly seen through the diffuse, semi-transparent, not yet contracted exudation in the anterior chamber. The haziness increases in extent and density, and in two or three days, may fill the whole anterior chamber. Then contraction takes place, the edges become sharp, withdraw from the periphery of the chamber, and the globular, gelatinous mass is very characteristic. If absorption begins before the whole anterior chamber is filled, the edges of the exudation are mostly less sharp, yet the disease may be diagnosticated by the comparative clearness of the upper part of the chamber. The upper part of the pupil appears like a black crescent, while the remainder is occupied by the grayish substance. Total absorption took place in all cases that came under my observation.

I have notes of about 18 cases of spongy exudation, which might serve to draw a sufficiently clear clinical picture of this peculiar form of iritis. There are, of course, transitional forms

in which the differential diagnosis offers some difficulty. They border, on the one side, on the ordinary plastic iritis, on the other, on the purulent iritis. The *pure* forms of spongy exudation are distinguished by the absence both of plastic pupillary excrescences and of pus (hypopyon). Immediately after the absorption of the hyaline, grayish substance, the pupil is widely dilated, free from adhesions, and the iris shows no structural changes. The recovery is rapid and complete. The transitional forms are, however, complicated with synechiæ and pupillary obstructions. The spongy exudation, in such cases, may be considered as an additional though peculiar feature of plastic iritis or irido-capsulitis. In some intense cases of spongy iritis, I have for a day or two been in doubt whether purulent iritis would develop or not. Though the yellowish tinge of the lowest part of the exudation looked suspicious of pus, yet it could be distinguished from hypopyon by its diffuse nature ; the border-lines were always gradually fading away, and never assumed the sharp outlines, nor had its centre the uniform saturated white color by which hypopyon is so distinguished.

I have seen spongy iritis, traumatic and spontaneous, complicated with venous hyperæmia of the retina, diffuse opacity of the vitreous, and grayish circumscribed exudations in the fundus, the form of which was oval with a longest diameter reaching two P DD. in length. They occupied the bottom of the vitreous chamber and covered the details of the fundus. This condition leads me to believe that they are compact exudations at the bottom of the vitreous, like those in the anterior chamber, though they greatly resemble circumscribed choroidal exudations, so much the more because the choroidal exudations in the initial stage are also surrounded by diffuse opacity of the vitreous. The complication with choroiditis and cyclitis is mentioned also by Schmidt and Gunning.

The anatomical nature of spongy exudation is a *fibrinous deposit*. Dr. *A. Alt** has examined and described one specimen taken from my collection, and in another case I extracted the exudation from a living eye, and placed it immediately under

* Anatomical Contributions, No. XII. These ARCHIVES. Next number.

the microscope. It consisted of a dense network of very delicate fibrils, enclosing white and red blood corpuscles, and of a finely granular substance. The case was that of a woman, on whose eye I had performed an iridectomy for glaucoma. The day after the operation the greater part of the anterior chamber was filled with a grayish, compact substance with sharp edges. This substance protruded through the wound, which was imperfectly closed. I seized the protruding part with a pair of iris forceps, and extracted it, together with a portion of the exudation which occupied the anterior chamber. This fibrinous nature explains the clinical features of the spongy exudation. In traumatic cases it is probably poured out from the cut edges of the coloboma, and when its quantity is limited it adheres to these edges and to the anterior capsule. After cataract extractions the shreds of the capsule may, perhaps, also furnish this kind of exudation. I have seen it in cases where the iris remained fairly normal and the pupil moderately dilated, whereas in the pupillary space the shreds of capsule were thickened, opaque, beset with whitish dots, and soon afterward a thicker, grayish, compact substance filled the pupillary space, projected into the anterior chamber, and overlapped the adjacent iris. During its contraction it assumed sharp edges, a small crescent of black pupil became visible, and at last, in from three to ten days, the whole mass was absorbed. It was impossible to mistake these grayish plugs for remnants of lens, since, one or several days after the removal of the cataract, the pupil was seen black, containing nothing but thin pieces of transparent capsule. The gradual development and increase of the spongy exudation could be watched, and offered the same features as in spontaneous spongy iritis. Its disappearance followed the same course.

From the different aspects which the spongy exudation presents, some conclusions as to its constituent parts may be derived. When the substance is uniformly semi-transparent (hyaline, gelatinous, like a dislocated lens), it probably consists exclusively, or almost exclusively, of coagulated fibrine; if it has a grayish or whitish-gray color, the fibrine seems to contain a certain

amount of white blood corpuscles, which, when accumulated in clusters, will appear like whitish dots. The yellowish or yellow-greenish tinge indicates, in my opinion, the presence of red blood corpuscles. This argument, I think, is strengthened by the fact that I saw only the lowest part of the exudation greenish-yellow, which, it seems to me, is due to the gravitation of the red blood corpuscles.

The *prognosis* of spongy exudation, as far as my present experience goes, is favorable.

Its *treatment* is simple, and need not here be dwelt upon.

IX. *Simple or plastic capsulitis figures in the table with* 5 *cases* (2½%), *and*—XV.—*purulent capsulitis with* 2 *cases* (1%).

The inflammatory processes which originate in the capsule, and either remain confined to it, or extend to the neighboring parts, if attentively watched, offer such distinctive features that the term capsulitis, as the inflammation of a special organ, is as applicable as that of iritis or keratitis. I have, in my former reports, dwelt more or less extensively on the clinical picture of this disease.

The history of the two hundred extractions now under consideration has added new material to complete the picture. The irritative processes, due to the incarceration of the capsule in the wound, have of late years been more closely studied, both clinically and microscopically (*A. Pagenstecher*, *O. Becker*, *Iwanoff*, *Von Wecker*, and others). The pupillary opacities which result from remnants of cataract, iritis, and chronic thickening of the capsule have, under the name of secondary cataract, been described over and over again, but the clinical picture of primary acute traumatic capsulitis seems not to have received the attention it deserves. The method of exsecting a quadrangular piece of the anterior capsule, which I have practised for many years, rendered observations on pure capsulitis particularly fruitful.

In typical cases the picture is the following. In a ripe, uncomplicated cataract, a square-shaped piece of capsule is circumcised with a sharp sickle-shaped cystotome, and removed either with the cystotome, or a delicate pair of forceps. In many

cases it comes out with the cataract. Repeatedly have I been able to find this piece of capsule, and identify it under the microscope. When I did not find it, I could, in many cases, demonstrate its excision by focal illumination. Since, in most instances, I was scrupulously careful in removing the remnants of lens, a perfectly free pupillary space, bordered by sharp edges of a grayish, translucent membrane, like the frame of a picture, could with oblique light and a large magnifying glass be distinctly seen, sometimes immediately after the operation, but always one or several days later, leaving no doubt that the quadrangular free space was not the result of a retraction, but of a removal of so much capsule. One or several days after the extraction, when the pupil was dilated with atropine, and free from iritic adhesions and remnants of the lens, the edges of the capsule were evenly stretched across the eye, at an appreciable distance behind the iris. The upper edge presented a narrow strip which was neither applied to the cornea nor adherent to the closed wound. The majority of these cases showed no reaction and yielded excellent results.

In some, however, peculiar changes took place in the capsule, and *in the capsule only*. Accompanied by moderate circumcorneal hyperæmia, one point of the edge (the frame) of the capsular window, commonly the inner-upper or outer-upper corner, grew opaque, gray or whitish. This opacity, in from two to four days, spread over the whole superior strip of capsule, cleared up at the corner from which it started, became more saturated and lingered for a few days at the opposite corner, then the whole superior strip cleared up, but the adjacent part of the vertical column of the capsule coloboma became opaque, and the opacity spread over the lateral edge in the same way as it had gone over the superior. While it cleared up, it extended over the lower edge, left this, and ascending, invaded the other lateral edge, which, in some days, also cleared up. While in this way the infiltration travelled all around the border of the capsule coloboma, the centre of the pupil, the aqueous and vitreous remained clear, the iris free from adhesion, and S continued

good. The duration of this process was from ten to fourteen days.

This picture of a simple, pure, uncomplicated capsulitis offers numerous variations. As has been said above, a kind of spongy exudation may be connected with it, obscuring the pupil for a while, then disappearing. The exudation, however, may also be diffuse, plastic, or purulent. Diffuse exudation renders the pupillary area and the whole anterior chamber turbid. The iris is hyperæmic, but the pupil is fully dilated, the circumcorneal injection and the pain are very moderate; absorption is followed by good sight. Plastic capsulitis is complicated with iritis. After a few days of irritation, the anatomical cause of which remains undetermined, a striated and irregularly opaque substance extends from the wound through the pupil, unites with the pupillary edge of the iris, contracts it, and draws the iris upward. I am speaking here of such cases in which the reaction originates in the capsule, and only secondarily involves the iris. The capsule, in such cases, is fastened in the wound, as may be demonstrated a day after the operation or later, and for a few days, this part of the capsule is the only one that becomes opaque and swollen. After a somewhat protracted course of from three to six weeks, the irritative symptoms disappear; a pupillary membrane is left; the vision is moderate, but becomes good by a simple horizontal or ⊥ shaped splitting of the membrane. Some degree of cyclitis seems to be connected with this kind of plastic capsulitis, for in a recent case in which I divided the pupillary membrane, about four weeks after the extraction, shreds of tissue could be seen behind it. Encouraged by *Wecker's* recent publications, I made this operation with a very sharp, broad needle, to prevent the iris from being drawn upward by the contracting pupillary membrane. The reaction was moderate and the result satisfactory.

Cases of *purulent capsulitis* I have seen frequently enough to distinguish its peculiar features. There is at first moderate circumcorneal injection, hyperæmia of the iris with a pupil dilatable by atropine. The pupil becomes hazy, and the capsule thickened and opaque. In cases where a part of the capsule

was removed, commonly one of the upper corners of the capsular coloboma first grows white, and then yellowish-white, bearing the greatest resemblance to a pustule. The surrounding capsule becomes opaque, and one or several other places, frequently the other upper corner, are the seat of other pustules. The centre of the pupil may remain tolerably clear, but hypopyon soon appears. If the capsule was irregularly divided, the pustules may appear in the centre or near the centre of the pupil, give rise to hypopyon, while the periphery of the pupil remains comparatively clear. It is by such cases (see my former reports), that I became convinced, I had to deal with a suppurative process of the capsule. There were no appreciable remnants of cataract, no visible changes in the vitreous, the iris was only moderately implicated—scant filiform adhesions —and the corneal section was perfectly closed and free from irritation. There was in these cases moderate pain, chemosis, œdema of the lids, and sero-mucous discharge. The suppuration may set in a week after the extraction or later, and I remember one instance where the patient had been discharged, at his urgent solicitation, though not fully cured, and returned a week later with a pustule in the centre of the pupil and hypopyon, pupil dilated, iris hyperæmic, and in some places adherent to the capsule; in less than a week the pustule and hypopyon had disappeared. The issue of these cases is mostly favorable; they require careful after-treatment (leeches, atropine, rest in bed, closure of the eyelids, darkness), but since severer complications on the part of the iris, ciliary body, and vitreous are absent, a more or less simple pupillary membrane is the only obstacle to good sight, and this obstacle can be easily removed.

X. *Simple Hyalitis* is mentioned in 6 cases (3%). Opacities of the vitreous are of very frequent occurrence after cataract operations, as we may convince ourselves by examining the eye with the ophthalmoscope during the first week after the extraction. They never fail, as far as my experience goes, after extractions with the capsule, whether these extractions are performed with or without the introduction of traction instruments; they are always present if the extraction is complicated

with prolapse of vitreous. The exudation in hyalitis may be diffuse, plastic (cords, flakes, and membranes), and purulent. In a majority of cases, especially after extractions with the capsule, they seem to be the result of hyperæmia and inflammation of the ciliary body. If the exudation remains diffuse (simple hyalitis), the issue is always good; if it is plastic, the recovery may linger and be imperfect, resulting in permanent floating opacities of the vitreous, with their prejudicial influences on the ciliary body, the substance of the vitreous, the hyaloid membrane—which may be detached—and the retina. They may, however, clear up after a duration of many months. I need hardly mention that hyalitis is frequently only a secondary affection, resulting from the lesions of the parts directly concerned in cataract operations.

All the cases of simple and plastic hyalitis noted in the table did well, one only (148) yielded a moderate visual result ($\frac{5}{200}$), offering, however, good prospects for an after-operation.

All the cases of XVI. *Suppurative Hyalitis* (5, or 2½%), led to the loss of the eye. In every one of them the cataract was complicated, and the extraction followed by loss of vitreous. The suppuration began in the vitreous itself, the cornea and iris being only secondarily involved. Enough has been said on this subject by *Arlt*, *Becker*, and others.

XI. *Cyclitis and Irido-cyclitis* are mentioned in 5 cases (2½%), one of which only was a success, and this case (No. 187) was very remarkable. After a smooth operation of a hard ripe cataract in a middle-aged man, with clear and dilated pupil, there was very marked circumcorneal injection, and gradually the inner-upper part of the iris became bulging, as we see it in the so-called crater-shaped pupil. The centre of the pupil remaining clear, vision good, and the bulging limited to the inner part of the iris, I abstained from operative interference, and saw that the protrusion, in the third week of its existence, began to diminish, and finally disappeared altogether, leaving V $\frac{20}{50}$. This was evidently a case of partial cyclitis, that is, in one place there was a sacculated cyclitic exudation behind the iris; the pronounced general circumcorneal injection and the discolora-

tion of the whole iris indicated that the whole ciliary body participated in the inflammation.

The cases mentioned in the table show that cyclitis, after cataract operations, as cyclitis in general, is commonly a secondary affection, engendered by extension of the irritation to neighboring parts. It may, in its course and consequences, become more important than the primary disease. In its graver forms, the chronic, frequently relapsing cases of irido-cyclitis, it represents one of the most deleterious eye diseases, since it not only is the terminal affection in one eye, but endangers the other by sympathy. I would longer dwell on this subject, but the remarks which *O. Becker* makes on it in his repeatedly quoted treatise, and the references to his own original investigations, and those of *A. Pagenstecher*, *Iwanoff*, and others, are so instructive that I am afraid of making too many repetitions.

XII. *Partial Suppurative Keratitis*, observed in 6 cases (3%), has, it seems to me, mostly local causes—bruising of the edges of the wound by the turning of the knife, or the passage of a hard cataract, impaction in the section of iris, capsule and remnants of lens, a good deal of rubbing to remove the cortex, cutting the edge of the flap, etc. In some cases it is difficult to determine whether the suppuration originates in the cornea or the adjacent part of the iris. Partial suppurative keratitis has often been described, and many modes of treatment for it have been highly praised as having the effect of preventing the suppuration from becoming total. I have, for years, and especially in cases making part of those now under consideration, treated partial suppurative keratitis as a pustule, which I opened more or less freely, evacuating the anterior chamber at the same time. The results have been highly satisfactory. This treatment, I think, is rational and should not be abandoned. Yet it has failed me in cases which, for a while, looked as if the suppuration would remain limited, and in other similar cases I have seen equally good results from expectant treatment. In the virtues of the compressive bandage (Schnürverband) which *Von Graefe* so highly recommended, I never have had great faith, and if I am well informed, this faith, without any refutation, is

gradually weakening. The explanation of the success of all methods of treatment in certain cases of keratitis suppurativa, and of the failure of all in others, seems to me that certain local causes, as mentioned above, exert only a limited injurious influence, whereas in other cases the causes or conditions that lead to suppuration are so powerful that no medication can avert the disastrous termination. It is only in the cases touching on the borderline of these two groups, that treatment may save an eye, or if injudicious, help to destroy it.

XIII. There were four cases (2%) of *total suppurative keratitis* among the two hundred; two of them showed the typical form of Graefe's "ring-abscess." The one case of "ring-abscess" (37) referred to a perfectly regular operation of a ripe cataract in a healthy person. Who can account for it? In the other case (6), smallness of the section and considerable rubbing to expel the cortex are noted. The next case (9) was again unexceptionable as to the conditions of patient and the operation, whereas in the fourth case (87), hypermaturity of the cataract, old age and decrepitude of the patient may be mentioned as predisposing causes. In opposition to Becker's statement* that "ring-abscess" does not seem to occur after Graefe's operation, the above cases convince me—and I am sure that in time every operator will share my conviction—that pure total suppurative keratitis is one of the disastrous issues of Graefe's operation, as well as of any other mode of extraction. The differences are only differences of frequency, not of kind, yet with regard to sloughing of the cornea, the linear methods have the advantage over the flaps.

XIV. *Purulent Iritis* was observed in 8 cases (4%). With the exception of one case (193), there was a direct cause of the suppuration mentioned; bruising of the border of the iris with the knife or lens, expulsion difficult, considerable cortex left. Since all these incidents are well borne by the majority of cases, to understand the inordinate reaction in certain cases we have to inquire into the *degree* of bruising, the condition of the iris, and the *quality* of the remnants of cortex. If, on examining an eye

* Treatise in Graefe-Saemisch, p. 367, line 11.

before the operation, we are led to assume a greater vulnerability of the iris, we should be very particular in making a large corneal section and a very large coloboma. I mention this with special reference to eyes the pupils of which dilate only insufficiently by atropine, for I think such irides are more vulnerable than others.

The eighth case (No. 193) was very remarkable for the spontaneous recovery, by absorption, of severe suppurative iritis and keratitis. Such cases, though rare, are important in showing how careful we must be in framing a hopeless prognosis, or in ascribing a saving influence to a certain mode of treatment which may not deserve it.

The *average stay of a patient at the hospital was* 18 *days*, which is more than it was in Heidelberg (14 to 15 days). The greater number of complicated cataracts, and severe reactive processes I had to deal with in New York, may account for the difference. The shortest stay of any patient at the hospital was five days, the longest forty-six.

The following table on the

VISUAL RESULTS

speaks for itself. It differs from my former reports in so far as this time the final results, taken from the last examinations obtainable, were noted, while formerly I noted the results obtained by the examination at the time the patients left the hospital. At the time of discharge the reactive processes have commonly not yet entirely diappeared, the scar is not completely consolidated, opacities in the refractive media have not sufficiently cleared up, etc., to show final visual results. This is the reason why in my former reports V $\frac{20}{20}$ was never, and V $\frac{20}{30}$ only rarely mentioned. The primary results are noted in a proper column of the general table which may be consulted as a proof of the above assertion. While in this report the acuity of sight obtained ranks higher than in my former reports, there is this time a certain, though small, number entered as failures which in the former reports were entered as successes, namely such cases in which a later disease—for instance, detachment of the retina, irido-cyclitis, etc., or an after-operation—destroyed that

amount of sight which the patient enjoyed when leaving the hospital. Remarkable, in this series, is the small number of moderate results (7.5%), and this is certainly owing to the particular care that was taken during the operation to clear the area of the pupil as much as possible from the capsule and remnants of cataract. To clear the pupil I have never introduced a Daviel's or other spoon, since at the beginning of my career I received the impression that such instruments were commonly not more, but mostly less, efficient than the rubbing manœuvre, and were rather dangerous. Tough capsules were removed with forceps, which method I consider comparatively uninjurious. The rubbing procedure, however, while clearing the centre of the pupil, is apt to push shreds of capsule and remnants of cataract between the lips of the wound, where, as foreign bodies, in a certain number of cases, they awaken an inflammation which may jeopardize many an eye that otherwise would have been saved. I remember that *Von Graefe*, after the expulsion of the cataract, took less pains to clear the pupillary space than I have done. To clear the area of the pupil is certainly a good thing, but in doing it we should avoid pushing capsule, lens matter, and perhaps iris into the corneal section. I have of late, as the terminal step of the operation, tried, with delicate forceps, to grasp and exsect shreds of capsule which I supposed lying in the corneal wound, and have succeeded in this attempt. After the excision I passed a blunt spatula through the corneal wound with a view of shifting the capsule back into the eye, even if I could not see it. The results of this procedure, thus far, have been encouraging.

Final Visual Results.

S $\frac{20}{30}$	in	21 cases	or	11.5%
S $\frac{20}{30}$	in	25 cases	or	12.5%
S $\frac{20}{40}$	in	28 cases	or	14 %
S $\frac{20}{50}$	in	28 cases	or	14 %
S $\frac{20}{70}$	in	31 cases	or	15.5%
S $\frac{20}{100}$	in	24 cases	or	12 %
S $\frac{20}{200}$	in	7 cases	or	3.5%
Good result	in	164 cases	or	82 %

S $\frac{15}{200}$ in 4 cases or 2 %
S $\frac{10}{200}$ in 3 cases or 1.5%
S $\frac{6}{200}$ in 1 case or 0.5%
S $\frac{5}{200}$ in 4 cases or 2 %
S $\frac{2}{200}$ in 1 case or 0.5%

Moderate result in 13 cases or 7.5%

S $\frac{1}{8}$ (perception of light with preservation of the shape of the globe) in 9 cases or 4.5%
S 0 in 14 cases or 7 %

Failure in 23 cases or 11.5%.

In order not to extend this paper too far, I shall here give only a brief account of the

AFTER-OPERATIONS

done on cases belonging to this series, so much the more because I intend at another time to discuss in detail this important subject, which of late has received so much attention by *De Wecker* and other authors. At the time when the general tabular statement was compiled, I had performed, on these 200 cases of extraction, thirty-three after-operations by methods and with results as follows:

I. *Division of secondary cataracts:*

a) with sickle needle 14; improved 13, unimproved 1;
b) with Graefe's knife 3; improved 2, unimproved 1;
c) with Beer's knife 4; improved 4, unimproved 0;

total 21; improved 19, unimproved 2.

II. *Iridotomy with Beer's knife and Tyrell's hook* 9, all improved.

III. *Iridotomy*, with fine scissors (not Wecker's, and previous to Wecker's publications) 1 case; eye lost.

IV. *Removal of old prolapse of iris*, 2 cases, result good.

Recapitulation: After-operations 33; improved 30, unimproved 2, lost 1.

REPORT AND REMARKS

ON A

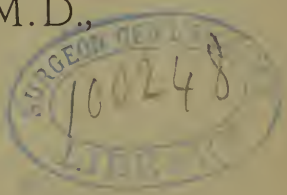
FOURTH AND A FIFTH HUNDRED

OF

CATARACT EXTRACTIONS,

ACCORDING TO VON GRAEFE'S METHOD.

BY H. KNAPP, M.D.,
OF NEW YORK.



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